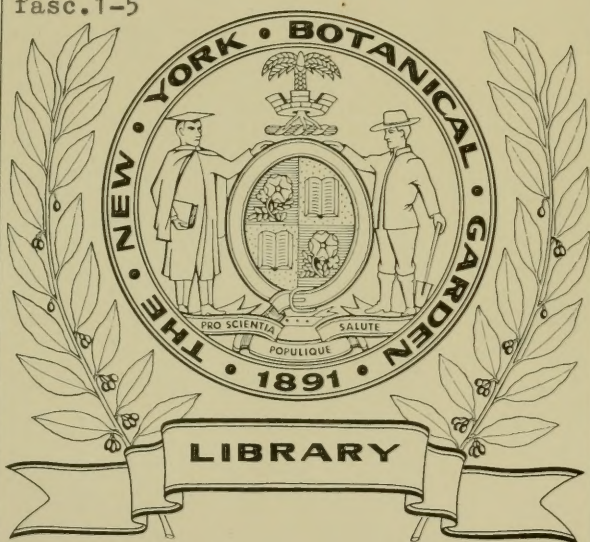


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OBSERVATIONS ON THE FLORA OF JAPAN.

Fasciculus 1.

1901.

By

T. Makino,

*Assistant in the Botanical Institute, Science College,
Imperial University of Tokyo.*

Reprinted from the BOTANICAL MAGAZINE, Tokyo, Vol. XV. 1901.

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Saxifraga (Diptera) **nipponica** Makino sp. nov.

Rhizome cylindrical, long-creeping, radicans, epigæous, loosely ramose, glabrous. Leaves tufted at the end of rhizome, erect, or ascending, flaccid, long-petioled, orbicular or subreniform-orbicular, $2\frac{1}{2}$ –7 cm. wide, cordate at the base, very obscurely lobed and dentate with depressed ovato-deltoid teeth on the margin, ciliated and disparsed with pilose hairs, palmately veined; petiole about 4–16 cm. long, slender, pilose with patent hairs, vaginate and ciliated at the base. Scape including the panicle much exceeding leaves and about 30 cm. in length, pilose with spreading hairs as is the rachis, bearing a small rudimentary leaf. Panicle loose, broadly and shortly pyramidal; rachis more or less flexuous, with linear-subulate sharp-tipped small bracts at bases of peduncles; peduncles spreading, filiform, strict, loosely branched into a few pedicels, with very small linear bracteoles at bases of pedicels; pedicels filiform, glandular-hairy as is the peduncle. Calyx 5-partite; tube short, adherent to the base of the ovary, depressed obconical, glandular-hairy; sepals more or less unequal in size, patent or more or less reflexed, ovate-lanceolate, acutish, ciliated with glandular hairs, herbaceous, 3-nerved, persistent. Petals 5, white, thin; the lower 2 much larger, unequal in size, pendulous, linear-lanceolate and more or less falcate, gradually attenuated towards the sessile base, acuminate with a sharp tip, entire, with veins running upwards, the larger one about 2 cm. long; the upper 3 patent, about 3 mm. long, ovate, apiculate, very shortly unguiculate, entire, obscurely loose-nerved, slightly thicker and yellow in the lower portion. Stamens 10, at first erect then patent; filament linear-filiform, attenuated towards the base, longer than sepals and 4–5 mm. in length; anther minute, ovato-rounded. Ovary broadly ovate, divided into 2 parts above and attenuated to the styles, glabrous; styles 2, erect, narrow; stigma very slightly thicker, oblique inwards; ovules numerous, minute, oblong.

Saxifraga sarmentosa f. *minor* Savatier in Inuma's Sōmoku-Dzusetsu,

ed. 2, VIII. fol. 11, recto.

Nom. Jap. *Haru-yukinoshita* (Y. Iinuma).

Hab. Prov. SHINANO: Mt. Togakushi (*K. Watanabe!* June 10, 1894).

A rare species; it differs from *S. sarmentosa*, Linn. fil., by the estoloniferous habit and the ramose and long repent rhizome.

Saxifraga* (Diptera) *madida Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 52.

Rhizome very short, erect or oblique, rooting. Leaves tufted, flaccid, reniform or reniform-orbicular, cordate at the base, 5–16½ cm. across, thin when dried, scattered with pilose hairs on the upper surface and ciliated on the margin, deeply divided into 7 to sub-11 broad-ovate to oblong-ovate lobes with obtuse sinuses; lobes paucilobulate; lobules incisely dentate with ovato-deltoid and mucronate teeth; veins palmate; petiole slender, 6–25 cm. long, villose-pilose with spreading hairs, vaginate and ciliated with long rufous-hairs at the base. Scape erect, pilose, usually bearing 1–3 small rudimentary ciliated leaves; panicle loose, narrowly pyramidal; rachis slender, more or less flexuous, furnished with small linear bracts fimbriato-ciliated below, glandular-hairy as are the peduncles and pedicels, which are filiform and bear linear-subulate bracteoles; the peduncles usually secund. Calyx 5-partite, the tube adherent to the base of ovary; sepals patent or reflexed, more or less unequal in size, oblong-lanceolate or ovato-lanceolate, obtuse or acute, entire, ciliated and disparse with glandular hairs, 3-nerved. Petals 5, white, thin; the lower 2 much larger, pendulous, equal in size, narrowly spathulate-lanceolate, acuminate, gradually narrowed towards the base and at length forming a filiform unguis, entire, about 2–2½ cm. long, 2½–4½ mm. broad, with a few loosely arranged nerves which run upwards; the upper 3 patent, about 4 mm. long, ovate, acutish or obtuse, distinctly unguiculate, with a few yellow spots, loosely few-nerved. Stamens 10, spreading, longer than the sepals; filament filiform, acute at the apex, gradually narrowed below; anther ovato-rounded, orange-coloured. Ovary broadly ovate, shortly divided into 2 above and gradually attenuated to the styles, yellowish green, with a yellow disk-shaped nectar placed across on its upper surface; styles 2, slender, beaklike; stigma thicker; ovules numerous, minute, oblong. Capsule with persistent sepals, styles, withering petals, and filaments, rounded-ovate, inflated, 2-divided above; carpel thin; seeds numerous, subcylindrical-oblong, minutely papillose, brown.

Saxifraga cortusefolia β. *madida* Maxim. in Mém. biol. VIII. p. 600;

Franch. et Sav. Enum. pl. Jap. I. p. 146; Yatabe Iconogr. fl. Jap. I. 1, p. 12, tab. VII.

Saxifraga cortusæfolia Sieb. et Zucc. pro parte, ex Maxim. l. c.

Saxifraga cortusæfolia forma foliis incisiss Savatier in Inuma's Sōmoku-Dzusesu, ed. 2, VIII. fol. 15, recto.

Nom. Jap. *Zinzi-sō, kikuba-daimozisō, yatsude-yukincshita, momidziba-daimozisō.*

Hab. Prov. TOSA: Nanokawa (*T. Makino!* Nov. 1884, Nov. 5, 1887; *K. Watanabe!* Sept. 30, 1891), Takaoka-gōri (*Y. Yoshinaga!*), Beppumura (*T. Makino!* Nov. 1892); Prov. ISE: Yuwochi-mura in Iidaka-gōri (*Z. Umemura!* Oct. 13, 1895); Prov. IDZUMI: Mt. Inunaki-san (*S. Matsuda!* Nov. 10, 1896, herb. Sc. Coll. Imp. Univ. Tokyo).

The 3-nerved sepals, ovate upper petals, equal-sized lower petals, and the more flaccid and more deeply lobed leaves should be taken as the principal characters to separate this from *Saxifraga cortusæfolia* Sieb. et Zucc.

Saxifraga cortusæfolia Sieb. et Zucc. Fl. Jap. fam. nat. in Abhandl. Akad. Münch. IV. 2, p. 190.

α. typica.

Leaves cordate at the base.

β. obtusocuneata Makino nov. var.

Less tall. Leaves usually smaller, obtuse-cuneate or sometimes truncate-cuneate at the base, flabellately 3 to sub-7-lobed; lobes dentate. Flowers as the *typica*.

Hab. Prov. TOSA: Matsubara-mura in Takaoka-gōri (*T. Makino!* Nov. 1885); Prov. IYO: Mt. Iwaya-san in Kami-Ukena-gōri (*K. Okudaira!* Oct. 6, 1897); Prov. KII: Mt. Nachi (*Z. Matsumura and Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, July 29, 1888).

KEY TO JAPANESE SPECIES OF *Saxifraga* sect. *Diptera* Engl.

Monogr. der Gatt. Saxifr. p. 153.

- | | | | |
|---|---|---|---|
| 1 | { | Stoloniferous, stolons filiform | <i>S. sarmentosa</i> Linn. fil. |
| | | { Estoloniferous.....2. | |
| 2 | { | With horizontally repent rhizome | <i>S. nipponica</i> Makino. |
| | | { Without repent rhizome.....3. | |
| 3 | { | Cauliscent | <i>S. sendaica</i> Maxim. |
| | | { Acaulescent.....4. | |
| 4 | { | 2 lower petals equal-sized, 3 upper petals ovate; | |
| | | { sepals 3-nerved. | <i>S. madida</i> Makino. |
| | | { 2 lower petals unequal-sized, 3 upper petals oblong | |
| | | { to linear-lanceolate; sepals 1-nerved.....5. | |
| 5 | { | Leaves cordate..... | <i>S. cortusæfolia</i> Sieb. et Zucc. <i>α. typica.</i> |
| | | { Leaves obtuse-cuneate. | <i>S. cortusæfolia β. obtusocuneata</i> Makino. |

Saxifraga tellimoides Maxim. var. **Watanabei** (Yatabe) Makino.

Saxifraga Watanabei Yatabe in Bot. Mag., Tokyo, VI. 1892, p. 43, tab. II, et Iconogr. fl. Jap. I. 3, p. 179, tab. XLIV.

Nom. Jap. *Watanabe-sō* (R. Yatabe).

Hab. Prov. Tosa: Nanokawa (*K. Watanabe*, July 12, 1899).

This is not more than the variety of *S. tellimoides* Maxim.

Saxifraga japonica H. de Boissieu Saxifr. Jap. in Bull. Herb. Boiss. V. p. 687.

Robust herb, attaining about 60 cm. in height. Rhizome thick, stout, erect or ascending, rooting. Basal leaves long petiolate, reniform-orbicular to ovato-orbicular, cordate at the base, attaining 14 cm. across, unequally dentate with deltoid teeth; petiole attaining about 28 cm. in length. Panicle pyramidal; pedicel usually longer than the flower. Flower about 6 mm. in diameter; petals white. Fruit (immature) 11 mm. long, erect, or cernuous, or sometimes nutant.

Nom. Jap. *Fuki-yukinoshita* (T. Makino).

Hab. Hokkaidō (Herb. Sc. Coll. Imp. Univ. Tokyo.); Prov. Echigo: Mt. Shimidzu-tōge (*T. Makino!* Sept. 1888); Prov. Rikuchū: Mt. Kurikoma (*T. Makino!* Aug. 23, 1890; *S. Ikeno!* herb. l. c., Aug. 23, 1890).

This comes near to *Saxifraga punctata* Linn. and is found on mountains in northern Japan.

Chrysosplenium flagelliferum Fr. Schmidt var. **tosaense** Makino.

About 5–17 cm. high. Roots delicate. Innovations horizontal, sub-hypogæous, few, filiform, often a little carnosé towards the base, leafless but with loosely alternate minute scales, about 1–4½ cm. long. Stem erect, simple, or with 2–6 branches dividing from the base, with reddish-fulvous hairs at the basal portion and nodes. Leaves petiolate, flaccid, thin when dry, thinly pilose; basal ones subrosulate, reniform, crenate with 5–7 emarginate teeth, 4 mm.–1¾ cm. long, 5 mm.–2½ cm. broad, veins loose and indistinct; upper cauline one none or 1, usually smaller than the basal ones; petiole about 2 cm. in the longest one, narrow, more or less dilated at the base, pilose-villose with reddish-fulvous hairs. Cyme ramose into 2 to 3 main erect-patent branches at the top of the stem, the branches usually repeatedly divided; bracts petiolate, spreading, unequal in size, broadly rounded or obliquely and broadly cuneato-ovate, crenate with 2 to 5 semiorbicular and minutely

emarginate teeth. Flowers laxly disposed, small, glabrous, shortly pedicellate, 3-3½ mm. in diameter. Calyx-tube obconical, ribbed longitudinally; lobes 4, 2 larger than the other 2, patent in flower, deltoid, obtuse, the vein obscure. Stamens 8, minute, shorter than the calyx-lobes; filament subulate; anther rounded, yellow. Disk thickish, fleshy. Styles 2, apart, divergent; stigma terminal. Ovules numerous, oblong. Capsule with persistent calyx and pedicel enlarging after anthesis, slightly compressed laterally; carpels campanulate after dehiscence. Seeds numerous, elliptical-oblong, reddish-ferruginous, very minutely papillose on the whole surface. Fl. April-May.

Chrysosplenium tosaense Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 52.

Nom. Jap. *Tachi-nekonomesō*.

Hab. TOSA: Nanokawa (*T. Makino!* Nov. 1884, June 1885; *K. Watanabe!* May 7, 1885, April 7, 1888), Mt. Torigata (*T. Makino!* May 22, 1889), Mt. Kuishi in Tadzikawa-mura (*T. Makino!* May 6, 1893), Tadzikawa (*T. Makino!* April 1889, May 1893); Prov. Iyo: Mt. Shiroe-goe in Ousen-gōri (*K. Okudaira!* May 2, 1897).

A southern variety; it differs from the typical one by the more luxuriant bracts, and innovations with minute scales instead of having the normal leaves.

A. Franchet, in his monograph, described the seed of *Chrysosplenium flagelliferum* Fr. Schmidt, as "semina ovalia, lucida, glaberrima," but it is in truth minutely papillose in all Japanese ones examined by me, and collected from various localities.

Asarum (Hetrotropa) **sakawanum** Makino in Botan. Mag., Tokyo, IX. 1895, p. 260.

Rhizome ascending or obliquely repent, terete, about 3-4 mm. thick, with many abbreviated internodes and alternately arranged semi-annular leaf-scars, simple or branched; roots long, terete, thick, with rootlets towards the extremities. Leaves persistent, 2 to 3 to a branch of the rhizome, erect or ascending, long-petioled, broadly ovate or deltoid-ovate, shortly acuminate with an acute tip, cordate or broadly auriculate with an open or close sinus and round-obtuse or broadly rounded-ovate lobes, entire and minutely ciliated on the margin, thickly herbaceous in texture, green and often shaded with purple colour, albo-variegated between the midrib and margins, glabrous but pubescent-pilose on veins and towards the margin, 6-15½ cm. long, 4-10 cm.

broad; midrib slender; main nerves 3 on each side of the midrib radiating from the base; veinlets fine, invisible superficially; petiole slender, more or less unequal in length than the blade, terete, canaliculate in the inside, glabrous, 7-16 cm. long; scaly leaves 2, ovate, acute or obtuse, membranaceous, ciliated. Flower 3-5½ cm. in diameter, solitary, nodding on the ground; peduncle terete, curved, glabrous, shorter than the flower, 1½-3 cm. long. Calyx 3-partite with acute sinuses, broadly campanulate with patent or recurvo-patent lobes; lobes ovato-deltoid to ovate-lanceolate, obtuse, even-sided, 1½-4 cm. long, carnose, glabrous, often minutely sub-scabrous externally, dark-purple and often more or less yellowish towards margins internally, the basal connate portion constricted below and connected to the tube with a small orifice in centre, with concentric plicate rugosities on the inner face; the tube globose with the ovary below, ventricose, glabrous, obscurely longitudinal-striate above externally, with numerous thick-membranaceous longitudinal lamellæ internally. Rudimentary inner calyx lobes 3, minute, 1½- nearly 2 mm. long, linear-spathulate, erect and closely placed on the back of stamens, alternate to the normal outer calyx-lobes. Stamens 12, inclined inwards, 2-2½ mm. long; filament extremely short; anther ovate-elliptical, cells extrorse and adnate to the connective which has a round-obtuse apex a little exceeding the cells. Styles 6, free, erect, slightly exceeding the stamens, ovato-cylindrical, glabrous, the top obtuse and sulcate with a minute channel which run over the inner side of the style; stigma minute, elliptical, situated on the back of the top. Ovary inferior with a little free upper portion, 6-locular; ovules minute, numerous, obovato-elliptical, arranged in 2-rows at the axial placentas. Seed (immature) obovoid, smooth, brown, with a large prominent fleshy raphe.

Nom. Jap. *Sakawa-saishin*.

Hab. Prov. Tosa: Sakawa in Takaoka-gōri (*T. Makino!* 1887, April 18 and May 9, 15, 1889, June 1893).

This is commonly found at mountain foot and hills in Sakawa-Village and its vicinities in the province of Tosa in Isl. Shikoku, and it has the largest flower among the Japanese species of *Asarum*. The inner lamellæ of the calyx-tube are arranged longitudinally without being reticulated one another, which never occurs in any Japanese species known till now. The habit of leaves is as that of *Asarum Thunbergii* Al. Br. (= *Heterotropa asaroides* Morr. et Decne.).

Sedum (*Seda genuina*) **hakonense** Makino sp. nov.

Perennial, about 6-10 cm. in height, glabrous. Stems loosely tufted,

erect or ascending, decumbent and radican at the base, narrowly terete. Leaves sparse, not dense, spreading or erect-patent, linear, more or less narrowed towards the sessile base, rounded-obtuse at the apex, entire, carnos-flat, green (or more or less glaucous?), $\frac{3}{4}$ - $2\frac{1}{2}$ cm. long, 2-3 mm. broad. Cyme 2-4 cm. across, 3-fid with patent branches, which are often again divaricately dichotomous; bracts similar to leaves in form, the largest one $2\frac{3}{4}$ cm. in length in our specimens. Flowers laxly disposed, sessile, about 7 mm. in diameter. Calyx 4-partite with broad and rounded sinuses; lobes minute, short, erect-patent, unequal in size, deltoid but the largest one often oblong, rounded-obtuse at the apex, fleshy, punctate, $\frac{1}{2}$ - $1\frac{1}{2}$ mm. long. Petals 4, white? but ferruginous when dried, patulous, ovate-lanceolate, acute, entire, thickly membranaceous, delicately 3-nerved, the lateral nerves dividing from the lower portion of the midvein and disappearing before reaching the apex. Stamens 8, equal to petals in height, alternipetalous ones adherent to the basal sides of petals, oppositipetalous ones inserted to inframedia of petals; filaments filiform; anther ovate-elliptical, purple? Hypogynous scales 4, minute, cuneato-obovate, retuse-truncate or obcordate at the apex. Ovaries 4, erect, equal to petals in height, connate with the lower half, tapering up towards the style; style short, erect, often very slightly thicker under the stigma; stigma punctiform; ovules minute, cylindrical-oblong, ascending. Follicles (immature) 4, erect, ovato-lanceolate, connate with the lower half. Seeds (immature) cylindrical, obtuse at both ends, ferruginous, 1 mm. long.

Nom. Jap. *Matsunoha-mammengusa*.

Hab. Prov. SAGAMI: Hakone (Herb. Sc. Coll. Imp. Univ. Tokyo, August 14, 1883).

A rare species; its peculiarity is the 4-merous flower. If the flower is white, it is very interesting, for all the Japanese species of the section have yellow flowers.

Sedum (*Seda genuina*) **tosaense** Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 52.

Perennial, flaccid, glabrous, about 12 cm. high, loosely tufted, with dense fibrous roots. Stem ascending, decumbent and radican at the base with many ascending floriferous branches, fleshy. Leaves sparse, flat, fleshy; the inferior ones orbicular-spathulate, narrowly attenuated at the base so as form the petiole, with a notch at the apex, entire, with delicate veins all of which go towards the common intramarginal vein, denser in the sterile stem,

the largest one attaining about 4 cm. in length; the superior ones smaller, loosely disposed, spatulate, narrowed below, with a notch at the apex. Cyme $1\frac{1}{2}$ –4 cm. across; branches 1–3, divaricate, short, simple or sometimes dichotomous, laxly 1–5-floriferous; bracts leaf-like, green, linear-spathulate, obtuse-emarginate. Flower about 9–10 mm. in diameter, very shortly pedicellate but sessile in the superior ones. Sepals 5, unequal in size, oblong-linear, but the largest one leaf-like and linear spatulate, obtuse. Petals 5, spreading, slightly connate at the base, oblong-lanceolate, acute, yellow. Stamens 10, shorter than the petals, oppositipetalous ones inserted to the inframedia of petals, and oppositisepalous ones adherent to basal sides of petals; filament filiform; anther broadly ovate. Hypogynous scales 5, minute, flat, rectangular-spathulate with a round-truncate apex. Ovaries 5, erect, connate at the base, lanceolate, sharply attenuated into a short and more or less recurved styles; stigma punctiform; ovules many, narrowly oblong, ascending. Follicles patulous, connate at the base, compressed laterally, tapering upwards. Fl. April.

Nom. Jap. *Yahazu-mannengusa*.

Hab. Prov. TOSA: Karatani in Tokano-mura (*T. Makino!* Autumn 1884, April 1885).

A rare species coming near *Sedum subtile* Miq.; it is distinguished by its notched leaves. It grows in stony place at the foot of maintains.

Sedum (Telephium) **viride** Makino Rev. of some Jap. Sp. of *Sedum* and *Cotyledon*, in *Bot. Mag.*, Tokyo, XI. 1897, p. 430.

Perennial, glabrous. Stem slender, erect, or ascending, attaining about 40 cm. or more in height, terete, internodes longer or shorter than the leaves and about $3\frac{1}{2}$ – $6\frac{1}{2}$ cm. long. Leaves mostly opposite, or sometimes 3-verticillate, spreading, green, sometimes dispersedly nigro-punctate, elliptical, $2\frac{1}{2}$ –nearly 5 cm. long, $1\frac{1}{2}$ –3 cm. wide, obtuse at the both ends, more or less irregularly repand-crenate, fleshy; lateral veins erect-patent, about 5–7 on each side; veinlets copiously anastomosing; petiole 5–10 mm. long. Corymb terminal, $3\frac{1}{2}$ –4 cm. across, flatly rounded at the top; peduncles erect-patent, bracteate; pedicles usually slightly shorter than the flower. Flowers dense, about 5 mm. in diameter, yellowish-green. Sepals 5, minute, ovato-lanceolate, acutish, 1-nerved, herbaceous, green, about $1\frac{1}{2}$ mm. long. Petals 5, erect-patent, connate at the very base, oblong-lanceolate, acute, entire, thin, 1-nerved, about $5\frac{1}{2}$ mm. long. Stamens 10, slightly shorter than the petals, oppositipetalous ones inserted to the inframedia of petals; filament

filiform; anther ovato-orbicular. Hypogynous scales 5, minute, obovato-spathulate, truncate at the top. Ovaries 5, erect, elliptical, shortly contracted at the base; style erect, shorter than the ovary; ovules minute, oblong. Follicles 5, erect, a little longer than the persistent petals, oblong-elliptical, gradually attenuated towards the base, acute towards the short and persistent style above; carpel thin. Seeds cylindrical-oblong, more or less enlarged above; coat membranaceous, loose, shortly beak-like at the apex.

Nom. Jap. *Ao-benkei*.

Hab. Prov. TOSA: Kamibun-mura in Takaoka-gori (*T. Makino!* 1884, 1885).

It grows in grassy places at the foot of mountains, and it comes between *Sedum verticillatum* Linn., and *S. sordidum* Maxim.

Gymnadenia Chidori Makino in sched. herb. 1894.

Habenaria (*Gymnadenia*) *Chidori* Makino in Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 48, et Id. XVIII. l. c. VII. p. 134; Yatabe Iconogr. fl. Jap. I. 3, p. 225, tab. LV.

Nom. Jap. *Hina-chidori*.

Hab. Prov. TOSA: Nanokawa (*K. Watanabe!* 1890).

Swertia Swertopsis Makino Bot. Notes from the Author's Priv. Cabin. II. p. 33.

Swertopsis umbellata Makino Illustr. fl. Jap. I. No. 11, p. 1, tab. LXVI; in Bot. Mag., Tokyo, VIII. p. 435.

Swertia umbellata Makino in Bot. Mag., Tokyo, VIII. 1894, p. 436; E. Gilg in Engl. et Prantl Natur. Pflanzenfam., Suppl. 1897, p. 283.

Nom. Jap. *Shinonomesō*.

Hab. TOSA: Nanokawa (*T. Makino!* June 10, 1885; *K. Watanabe!* 1886, Oct. 18, 1889), Mt. Dōgamori (*K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Oct. 14, 1891); Prov. IZU: Mt. Amagi (*K. Nemoto!* Aug. 27, 1894).

Rubus pseudo-Acer Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 53.

Under-shrub. Rhizome obliquely erect, narrow, mainly rooting towards the neck. Stems erect or ascending, slenderly terete, glabrous, smooth, or

more or less subscabrous, or sometimes sparingly armed with patent and nearly straight prickles, flexuous above, branched; branches slender, sometimes flexuous, terete, glabrous, smooth. Leaves alternate, erect-patent, long-petioled, ovato-orbicular in outline, cordate at the base, $2\frac{1}{2}$ -11 cm. across, membranaceo-chartaceous, nearly glabrous beneath, pubescent on the veins above, deeply and palmately 5-9-fid with narrow and obtuse sinuses; lobes again inciso-lobulate with narrow sinuses; lobules irregularly inciso-dentate with vary argute narrowly deltoid and often more or less falcate ascending teeth; the mid-lobe largest and outer lobes gradually smaller; main nerves palmately radiating from the base; lateral veins ascending, one to each lobule; veinlets finely anastomosing; petiole slender, strict, terete, slenderly canaliculate in front, dilated and glandular-margined at the base, glabrous and sometimes armed with a few incurved spreading prickles, $1\frac{1}{2}$ -7 cm. long; stipules adnate below, subulate-lanceolate, sharply pointed, thin, glabrous, entire and minutely glandular-margined, 3-11 mm. long in the free portion, veins running upwards. Cyme terminal and often in the axil of the uppermost leaf, loose; peduncle filiform, with small bracts which have taper-tipped and glandular-margined linear stipules; pedicel filiform, erect-patent except an erect central one, glabrous, $1\frac{1}{2}$ - $3\frac{1}{2}$ cm. long. Flower about 13 mm. across. Calyx shallowly campanulate, 5-fid; the tube shortly and broadly obconical, thick, glabrous, but pubescent at the bottom internally; lobes erect-patent in flower, but enlarged in size and reflexed together with the tube in fruit, deltoid-ovate, with a minute and narrow simple or trifid acumen at obtuse or sometimes nearly emarginate apex, entire and often loosely glandular-hairy on the margin, woolly-pubescent towards the margin; veins obscure superficially. Petals 5, white, small, subrhombic-orbicular, round at the apex, clawless and broadly obtuse at the base entire, thin, with fine and flabellate veins, $4\frac{1}{2}$ -5 mm. long, $4\frac{1}{2}$ - $5\frac{1}{2}$ mm. broad. Stamens numerous, inserted on the throat of the calyx-tube, erect, unequal in length, very slightly shorter than the calyx-lobes; filaments filiform, sharply pointed at the apex, glabrous; anther ovato-elliptical, cordate at the base. Ovary-cluster globose, about 3 mm. across, sessile; ovaries minute, numerous, crowded on a globose receptacle, sessile, reniform-lunate, laterally compressed, glabrous, but pubescent above in the ventral suture; style filiform, flexuous; stigma terminal, dilated. Fruit scarlet, ovoid-globose, about 7-10 mm. long, accompanied with dried filaments and more or less enlarged reflexed persistent calyx; carpels numerous, succulent, obovoid-elliptical, about 4-5 mm. long; stone hard, obovately reniform-elliptical, isabel-brown, finely foveolate-rugose, about 2 mm. long.

Nom. Jap. *Miyama-momidziichigo*.

Hab. Prov. TOSA: Mt. Tebako (*T. Makino!* July 1885; *I. Doi!* Aug. 13, 1890, Aug. 11, 1892; *R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 8, 1888); Prov. IYO: Mt. Ishidzuchi (*R. Yatabe!* herb. l. c. Aug. 9, 1888; *K. Okudaira!* Aug. 1892, June 25, 1897; *Z. Umemura!* Aug. 18, 1897).

A rare species, its leaves bearing some resemblance to those of certain maples. It is usually growing in shady places in the forest on mountain districts.

Rubus trifidus Thunb. **var. tomentosus** Makino var. nov.

Stem and leaves softly tomentose. Teeth of leaves semiorbiculato-ovate, minutely mucronate; stipules linear or linear-lanceolate, acuminate. Flower shortly pedicellate, about $3\frac{1}{2}$ cm. in diameter. Calyx-lobes ovato-lanceolate, attenuated above, tomentose. Petals 5, patent, white, orbicular, rounded and often submarginate at the apex, subunguiculate. Stamens numerous, glabrous.

Nom. Jap. *Birōdo-kadziichigo*.

Hab. TOSA (*T. Makino!* 1885), Ōhama in Hata-gōri (*T. Makino!* Aug. 10, 1889), Sakawa, cult. (*T. Makino!* 1892).

It grows near sea-side, and is distinguished by its downy habit, which reminds of that of *Rubus corchorifolius* Linn. fil.

Rubus rosæfolius Sm. **a. tropicus** Maxim. in Mém. biol. VIII. p. 388; Hance in Journ. Bot. 1878, p. 10.

a. genuinus Makino.

Elate shrub, prickly. Fruit globose, scarlet.

Rubus rosæfolius Sm.; Willd. Sp. Pl. II. p. 1080; Pers. Syn. Pl. II. p. 50; Spreng. Syst. Veg. II. p. 527; Seringe in DC. Prodr. II. p. 556; Blume Bijdrag. p. 1107; Roxb. Fl. Ind. II. p. 518; Miq. Fl. Ind. Bat. I. 1, p. 375; Kurz Fl. Brit. Burm. I. p. 439; Hook. Icon. Pl. tab. 349; F. Muell. Fragm. Phytogr. Austral. IV. p. 32; Benth. Fl. Austral. II. p. 431; Clarke in Journ. Linn. Soc. XV. p. 140; Hook. fil. Fl. Brit. Ind. II. p. 341; Hance in Journ. Bot. 1884, p. 42; Bot. Mag. tab. 6970; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 237; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 40.

Rubus pinnatus Willd. l. c. p. 1081; Pers. l. c.; Spreng. l. c.; Seringe in DC. l. c.; Ait. Hort. Kew. ed. 2, III. p. 270.

Rubus javanicus Blume l. c. p. 1108.

Rubus roseiflorus Roxb. l. c. p. 519.

Rubus asper Don. Prodr. Fl. Nep. p. 234; Seringe in DC. l. c. p. 558.

Rubus sikkimensis O. Kuntze MSS. ex Hook. fil.

Rubus paniculatus Clarke l. c. non Sm. ex Hook. fil.

Rubus Eglanteria Tratt.

Nom. Jap. *Ō-baraichigo*.

Hab. Prov. TOSA: Koyaika (*T. Makino!* Oct. 19, 1895), Iburi (*T. Makino!* Oct. 25, 1895), Godai-san near Kōchi (*T. Makino!* July 1892, Sept. 29, 1892, May, 1893).

It is not uncommonly found in the southern parts of the province of Tosa in the island of Shikoku. Majority of my specimens are sterile, but those collected on Godai-san near Kōchi, quoted above, bear red fruits.

b. minor Makino.

About 2-6 decim. in height. Rhizome stout-filiform, widely creeping, rooting. Stem erect, slender, terete, flexuous, puberulent, very laxly armed with prickles; branches slender, pubescent, loosely armed with prickles; prickles mainly more or less curved upwards or straight, patent perpendicularly to the stem, narrow, laterally compressed, sharply pointed, decurrent at the base above and below. Leaves alternate, simply odd-pinnate with 5 to 11 leaflets, $3\frac{1}{2}$ -18 cm. long including the petiole and 2-9 $\frac{1}{2}$ cm. wide; rachis narrow, pubescent, loosely armed with sharp prickles which are patent and a little curved upwards or downwards; leaflets thinly pubescent on both surfaces and moreover minutely glandular beneath, lateral ones very shortly petiolulate or sessile, but usually larger in size and distinctly petiolulate in the odd one, lanceolate to ovate-lanceolate, acuminate, usually obtuse-rounded at the base, but sometimes acute in the odd one, sharply duplicato-inciso-serrate, thinly chartaceous; midrib sometimes furnished with a few small prickles towards the base; lateral veins more or less regularly arranged, erect-patent, each reaching to the teeth; veinlet very finely anastomosing; petiole slender, 1-4 $\frac{1}{2}$ cm. long, pubescent and loosely armed with prickles, slenderly canaliculate in front, slightly dilated at the base; stipules inserted at the base of the petiole, linear to lanceolate or sometimes subulate-linear, acuminate, entire, pubescent and glandular outside, ciliated, with a midrib and obscure fine veins, 4-8 mm. long, persistent. Flower about 2 $\frac{1}{2}$ -3 $\frac{1}{2}$ cm. in diam., terminating the branches; peduncle filiform, pubescent. Calyx 5-partite with obtuse sinuses, pubescent, and glandular at the tube; the tube short and broad, truncate at the base, the centre of the base concave externally but conical internally; lobes patent and

then reflexed, ovate-lanceolate caudately acuminate, ciliated, with vertical veins, about 10 mm. long in flower but after anthesing increasing in size. Petals 5, patent, ovate-orbicular to elliptical, entire or with often irregular margin, rounded at the apex, shortly attenuated at the base and sometimes obscurely subungulate, 14-20 mm. long, 8-13 mm. broad. Stamens numerous, inserted to the throat of the broad calyx-tube; filament filiform, unequal in length; anther ovate-elliptical, cordate at the base. Ovary-cluster ovoid, with an erect and pubescent stalk. Ovaries numerous, minute, close-placed, lunato-ovate, glandular on the back, sessile and intermixed with hairs; style terminal, filiform, straight, glabrous, more or less clavate towards the terminal stigma.

Rubus rosaeifolius var. *minor* Makino in sched. herb. Sc. Coll. Imp. Univ. Tokyo.

Nom. Jap. *Hime-baraichigo*.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1885, May 15, 1889, Nov. 1892), Mt. Yokogura (*T. Makino!* May 6, 1889, 1892, May 1893), Mt. Kuishi (*T. Makino!* Oct. 7, 1892), Takaoka-gōri (*Y. Yoshinaga!* herb. Sc. Coll. Imp. Univ. Tokyo); Prov. IYO: Nametoko (*Z. Unemura!* May 14, 1896); Prov. MUSASHI: Tokyo (Herb. Sc. Coll. Imp. Univ. Tokyo.); Prov. IZU: Mt. Amagi (*S. Ōkubo!* herb. l. c. June 9, 1883); Prov. YAMATO: Kasuga-yama (*Z. Matsumura!* herb. l. c. July 15, 1883).

This form is much smaller than the type. The pubescent hairs bear no gland, but the under surface of leaves and the outside of the calyx-tube are dispersed with minute globular glands. The prickles are often more or less curved upwards.

β. sorbifolius (Maxim.) Makino.

More densely crinite with patent and hispidly hirsute glandular-hairs on the stem, petiole, and leaf-rachis. Flowers many, paniculate. Fruit yellow, inflated, oblong.

Rubus sorbifolius Maxim. in Mém. biol. VIII. p. 390; Franch. et Sav. Enum. pl. Jap. I. p. 127.

Nom. Jap. *Koziki-ichigo*.

Hab. TOSA: Sakawa (*T. Makino!* 1884), Ochi (*T. Makino!* May 1893); Prov. AWA (=Bōshū): Mt. Kiyosumi, forma (*T. Makino!* April 1896, April 1898).

γ. coronarius Sims **a. simpliciflorus** Makino.

Flower simple. Fruit oval-globose, scarlet.

Rubus rosaeifolius β. *coronarius* 1. *flore simpliciflori* Maxim. l. c. p. 388;

Ito et Matsum. Tent. Fl. Lutch. p. 183.

?*Rubus chinensis* Ser. in DC. Prodr. II. p. 557.

Nom. Jap. *Bara-ichigo*.

Hab. Prov. TOSA: Nanokawa (*T. Makino!* Nov. 1884); Prov. IYO Shiroe-no-taki (*Z. Umemura!* Aug. 17, 1897); Prov. SAGAMI: Mt. Hakone (*T. Makino!* Oct. 6, 1886); Prov. SURUGA: Mt. Fuzi (*S. Matsuda!* July 28-31, 1891; *Z. Umemura!* Aug. 29, 1898).

A wild form bearing normal flowers, especially growing on mountains and dwarf.

b. pleniflorus Makino.

Rubus rosaeifolius β . *coronarius* Sims in Bot. Mag. tab. 1783; Seringe in DC. l. c.; Hook. Icon. Pl. sub. tab. 349; Franch. et Sav. l. c. p. 126; Maxim. l. c. p. 388.

Rubus rosaeifolius β . *coronarius* 2. *flore pleno* Maxim l. c.

Rubus sinensis Hort. ex Sims.

Rubus Commersonii Poir. Encycl. VI. p. 240; Pers. l. c. p. 51; Spreng. l. c. p. 527.

Rubus rosaeifolius Miq. Prol. fl. Jap. p. 222.

Nom. Jap. *Tokin-ibara*.

Hab. Prov. TOSA: Kōchi (*T. Makino!*).

A cultivated form; it has double flowers.

Polypodium trichomanoides Sw. Syn. Fil. p. 33; Willd. Sp. Pl. V. p. 184; Spreng. Syst. Veg. IV. 1, p. 50; Schkuhr. Krypt. Gew. p. 11, tab. 10; Presl Tent. Pteridogr. p. 178; Mett. Farngatt. Polypod. p. 40; Hook. Sp. Fil. IV. p. 178; Bedd. Fern. Brit. Ind. tab. 2; Id. Handb. Ferns Brit. Ind. Ceyl. a. Mal. Penins. p. 308, fig. 162; Hook. et Baker Syn. Fil. p. 326; C. B. Clarke A Rev. Fern. North. Ind. in Trans. Linn. Soc. 2nd Ser. I. p. 549; Christ Die Farnk. der Erde, p. 80; Diels in Engl. et Prantl Natürl. Pflanzenfam. I. 4, p. 309, fig. 162, C. D.

Polypodium brevipes Kunze herb. ex part. ex Mett. l. c.

Polypodium Riedelianum Kunze herb. ex Mett. l. c.

Polypodium Beyrichianum Presl l. c.

Grammitis tenuifolia Beyrich herb. ex Presl l. c.

Polypodium monosorum Fée, ex Mett. l. c.

Polypodium gibbosum Fée 6^{me} Mém. Foug. Nouv. p. 8, tab. 2, fig. 2.

Polypodium serricula Fée Gen. Fil. p. 238, et 6^{me} Mém. Foug. Nouv. p. 9, tab. 7, fig. 1.

Polypodium nanum Fée Gen. Fil. p. 238.

Polypodium sertularioides J. Sm.

Arthropteris trichomanoides J. Sm.

Polypodium Okuboi Yatabe in Bot. Mag., Tokyo, V. 1891, p. 35, tab. XXI; Baker in Ann. of Bot. V. p. 465.

Nom. Jap. *Ōkubo-shida, ōkubo-uraboshi.*

Hab. Prov. SAGAMI: Ashinoyu in Mt. Hakone, on stone-walls and tomb-stones (*S. Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, 1888; *S. Hirase!* herb. l. c. Jan. 7, 1891); Prov. SURUGA: Mt. Fuzi-san, associated with mosses on trunk of large tree (*Z. Umemura!* July 21, 1899; *T. Makino!* August 7, 1899)

Distrib. Tropical Asia and tropical America.

This pigmy fern is rarely found in Japan. The fronds of my specimens from the forest of Mt. Fuzi-san, as cited above, attain 7 cm. in length, and 8 mm. in width.

Polypodium hirtellum Bl. Enum. Fil. Jav. p. 123; Metten. Farn-gatt. Polypod. p. 35, et Filices in Ann. Mus. bot. Lugd.-Bat. II, p. 219; Hook. Sp. Fil. IV, p. 166; Bedd. Fern. Brit. Ind. tab. 212, et Handb. Fern. Brit. Ind. Ceyl. a. Mal. Penins. p. 305, fig. 159; Hook. et Baker Syn. Fil. p. 320.

Grammitis pusilla Bl. *α.*, *β. alpestris* Bl., et *γ. lasiosola* Bl. Fl. Jav. Fil. p. 109–10, tab. 46, figs. 4–6.

Polypodium alpestre Bl. Enum. Fil. Jav. p. 123.

Polypodium lasiosora Hook. Sp. Fil. IV p. 166; Bedd. Fern. Brit. Ind. tab. 172.

Grammitis nana Fée 6^{me} Mém. Foug. Nouv. p. 7, tab. 6, fig. 1.

Nom. Jap. *Hime-uraboshi* (nom. nov.)

Hab. Prov. SATSUMA: Mt. Kaimon-ga-dake, on trunk (*M. Shirai* and *S. Ikeno!* August 27, 1893).

Distrib. Java, Luzon, and Ceylon.

The largest frond of my specimens, which I owe to the kindness of Prof. S. Ikeno, measures nearly 2cm. in length, and 2½ mm. in breadth, and it is to be well identified with Fée's plant cited above.

Polypodium lineare Thuub. var. **distans** Makino.

Rhizome long-repent, slender, wiry, 1–1½ mm. across, emitting fibrous

roots below throughout, distantly placed with small protuberances which are basal remainders of old stipes above, simple or laxly ramose, scattered with very minute deltoid or deltoid-ovate acuminate subpeltate brownish-black deciduous scales; scales which are clothed on the basal knot of stipes very minute, deltoid-ovate, acuminate, closely reticulated with blackish-brown venules, irregularly eroso-dentate on the margin. Fronds persistent, simple, in a small number, distant, linear-lanceolate, distinctly stipitate, gradually attenuated acuminate with a fine obtuse apex, gradually narrowed towards the base and at length decurrent to the stipe, entire or slightly repand, narrowly involute along the margins, 8-20 cm. long, 4-13 mm. or rarely 17 mm. wide, membranaceo-coriaceous, glabrous, but thinly dispersed with very minute deltoid acuminate scales on the midrib towards the base beneath, deep-green and minutely nigro-punctate above, paler beneath; midrib slender, prominent and darkish above and less prominent and stramineous beneath; veins invisible superficially, erect-patulous; veinlets rather finely anastomosing, with simple or divergently forked free venules within their areoles; stipes slender, about $1\frac{1}{2}$ -4 cm. long, hard, darkish, terete, with two fibro-vascular bundles in the centre, articulated at the base, from which they finally off way. Sori in two rows between the midrib and margins very slightly nearer the former than the latter in the upper half or one-third of the frond, distant about 2 to 5 mm. to one another, situated between veins, rounded, or sub-orbicular, or oval, $1\frac{1}{2}$ -2 mm. across, yellow, covered with minute peltate scales when young; scales sub-orbicular or oval, irregularly lobulate on the margin, with stout and darkish-brown venules, shortly stalked, soon falling way. Sporangia numerous, compact, intermixed with peltate and long-pedicellate paraphyses; the case slightly compressed, obovate; the pedicel slender, longer than the case.

Polypodium sesquipedale Wall. *forma leiopteris* Makino Phanerog. et Pterid. Jap. icon. illustr. I. tab. VIII. excl. syn.

Nom. Jap. *Miyama-nokishinobu*.

Hab. Prov. SHIMOTSUKE: Nikkō (Herb! Sc. Coll. Imp. Univ. Tokyo, Oct. 8, 1879); Prov. IDZU: Yoshida (Herb! l. c. June 4, 1883); Prov. IYO: Mt. Ishidzuchi (*R. Yatabe!* herb. l. c. Aug. 9, 1888; *Z. Umemura!* Aug. 18, 1897); Nishidani-mura (*K. Watanabe!* herb. l. c. March 3, 1891); Prov. TOSA: Nanokawa (*T. Makino!* Nov. 1884, June 10, 1885), Kitagawa in Nanokawa (*T. Makino!* Nov. 3, 1887), Mt. Tebako (*T. Makino!* Aug. 1885); Prov. MIKAWA: Mt. Chausu in Hadzu-gōri (*G. Nagura!* July 13, 1895); Prov. MUSASHI: Mt. Bukō (*T. Makino!* July 20, 1888); Prov. SAGAMI: Mt. Hakone (*T. Makino!* Sept. 27, 1886).

This is widely distributed over Japan, especially in mountain districts. It differs from the *typica* (Thunb. Fl. Jap. p. 335, et Icon. pl. Jap. Dec. 2, tab. 9; Makino Phanerog. et Pterid. Jap. icon. illustr. I. tab. IX) by the more distantly placed and thinner frond, much slender rhizome, and much smaller and deltoid scales. My plant seems to be related to a Chinese Fern *Polypodium lineare* Thunb. var. *contortum* Christ (in Baroni et Christ in Nuov. Giorn. bot. italia., Nuov. Ser. IV. 1, 1897, p. 98, tab. I, figs. 3, 3, 3, 3.), from which it differs by not contorting when dried.

Cladrastis platycarpa (Maxim.) Makino nom. nov.

Sophora platycarpa Maxim. in Mém. biol. IX. p. 71; Franch. et Sav. Enum. Pl. Jap. I. p. 113.

Platysprion platycarpum Maxim. l. c. p. 659.

Nom. Jap. *Eudzgi-gi*.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* 1884, etc.), Torinosu in Sakawa-mura (*T. Makino!* June 1893); Prov. IYO: Higashigawa in Kami-ukena-gōri (*K. Okudaira!* June 1894); Prov. MUSASHI: Mt. Bukō (*T. Makino!* July 20, 1888), Mt. Takao (*T. Makino!* July 16, 1890); Prov. SAGAMI: Miyanoshita in Mt. Hakone (*T. Makino!* Oct. 1886).

Cladrastis shikokiana Makino nom. nov.

Sophora shikokiana Makino in Bot. Mag., Tokyo, VI. 1892, p. 53, et XIV. pp. 34, 56.

Nom. Jap. *Yuku-no-ki, miyama-fudzigi*.

Hab. Prov. ETCHŪ: Foot of Mt. Tate-yama (*R. Yatabe* and *Z. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 23, 1884); TOSA: Nanokawa (*T. Makino!* Nov. 1884, June 10, 1885), Mt. Tebako-yama (*K. Naganuma!* Aug. 1885; *R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 8, 1888), Beppu-mura (*T. Makino!* Nov. 1892); Prov. HIGO: Mt. Yamainu-dake in Goka-no-shō (*N. Nakayawa!* July 30, 1896).

This species is allied to the North-American *Cladrastis tinctoria* Raf. (= *Virgilia lutea* Michx. f.), with narrower and firmer leaflets.

Tricyrtis flava Maxim. in Mém. biol. VI. p. 268; Franch. et Sav. Enum. Pl. Jap. II. p. 75; Yatabe Iconogr. Fl. Jap. I. p. 139, tab. XXXVII.
var. nana Makino in Bot. Mag., Tokyo, XI. 1897, p. 282.

Tricyrtis nana Yatabe in Bot. Mag., Tokyo, VII. p. 39, tab. III.

Nom. Jap. *Chabo-hototogisu* (T. Makino).

Hab. Prov. TOSA: Mt. Shakushi-goe in Hata-gōri (*T. Makino!* Nov. 7, 1885), Yatate-zaka (*T. Makino!* Nov. 8, 1885), Mt. Hōnokawa (*Y. Yoshinaga!*), Mt. Imano-yama (*T. Makino!* Aug. 7, 1889), Sōdzu in Aki-gōri (*T. Makino!* June 3, 1892), Motoyama (*S. Yano!* Aug. 25, 1892); Prov. IYO: Shinoyama in Kita-uwa-gōri (*K. Okudaira!* Aug. 8, 1894), Nametoko (*Z. Umemura!* Aug. 21, 1896).

This is not more than a dwarf variety of *Tricyrtis flava* Maxim.

Liparis nervosa (Thunb.) Lindl. Gen. et Sp. Orchid. Pl. p. 26; Miq. Prol. Fl. Jap. p. 135, excl. Benth. Fl. Hongk.; Franch. et Sav. Enum. Pl. Jap. II. p. 21 (excl. pl. Niko. Savatier n. 1319?).

Ophrys nervosa Thunb. Fl. Jap. p. 27.

Epidendrum nervosum Thunb. Ic. Pl. Jap. Dec. 1, tab. 10.

Malaxis nervosa Sw.; Willd. Sp. Pl. IV. p. 98; Pers. Syn. Pl. II. 1807, p. 514; Spreng. Syst. Veg. III. 1826, p. 740.

Liparis cornicaulis Makino Illustr. Fl. Jap. I. no. 8, p. 1, tab. XLVII.

Kokuran Inuma's Sōmoku-Dzusetsu, ed. 2, XVIII. fol. 44 recto, no. 43.

Nom. Jap. *Kokuran*.

Hab. Prov. TOSA (*K. Naganuma!* 1886), Sōdayama-mura (*T. Makino!* June 20, 1887), Mt. Mikushi-zaka in Eno-mura, Hata-gōri (*T. Makino!* Aug. 5, 1889).

Thunberg's original plant is destitute of the stem, therefore it is very difficult for identification, but it may be Japanese *Kokuran*, which is not Ridley's species in Journ. Linn. Soc. XXII. p. 262. It is very closely allied to *Liparis formosana* Reichb. fil. (= *L. bituberculata* Lindl. var.? *formosana* Ridley), but the wings of the column and the apex of the labellum differ more or less from it.

Liparis bambusæfolia Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 48.

Liparis nervosa Benth. Fl. Hongk. p. 352; Ridley Monogr. Gen. Liparis, in Journ. Linn. Soc. XXII. p. 262, excl. syn.; Makino in Bot. Mag., Tokyo, XI. p. 72, excl. syn. plur., non Thunb.

? *Empusa paradoxa* Miq. Prol. Fl. Jap. p. 135; Franch. et Sav. Enum. Pl. Jap. II. p. 21.

Sasaba-ran Inuma's Sōmoku-Dzusetsu, ed. 2, XVIII. fol. 42 recto, no. 41; Makino Illustr. Fl. Jap. I. no. 12, ined. tab. LXXIII.

Nom. Jap. *Sasaha-ran*, *sasaba-ran*.

Hab. Prov. TOSA: Kinzyōno (*T. Makino!* Aug. 2, 1889), Hirono in Hata-gōri (*T. Makino!* Aug. 8, 1889).

This differs from *Ophrys nervosa* Thunb., or *Liparis nervosa* Lindl., by its lanceolate leaves and ovoid-globose pseudo-bulb.

***Commelina communis* Linn. var. *hortensis* Makino, 1894.**

Stem ascending, robust, more or less flexuous, ramose, glabrous, but more or less tomentose along one side at the top; internodes about 5–9 cm. long. Leaves lanceolate, but the superior ones often ovato-lanceolate, acuminate, curved backwards, entire, obtuse at the base, shortly petioled, membranaceous, scabrous towards the margin above, 4–15 cm. long, 2–3½ cm. broad; midrib slender; veins more or less arcuate, several on each side, with closely placed fine transverse venules between them; petiole vaginate, the upper ones often tubular, 1¼–nearly 2 cm. long, membranaceous, longitudinally veined, ciliated-margined. Spathe solitary, opposite to leaves, with a peduncle which is very slightly shorter than the spathe, orbicular, cordate at the base, acute at the apex, complicate, forming a lunato-semiorbicular shape, green, membranaceous, pilose towards the centre, about 3–3½ cm. long, minutely ciliated on and minutely scabrous-pubescent towards the margin; veins much arcuate, several, with obliquely traversed fine numerous venules between them. Cyme included, glabrous, the upper branch with one sterile flower and the lower with 3 fertile flowers. Petals: the larger 2 exerted, ample, broad, thinly membranaceous, crispate, bright blue. Stamens 6; 2 longer ones with normal oblong-lanceolate sagittate anthers; 4 shorter ones with yellow nectariform anthers; filament filiform. Ovary oblong, glabrous; style filiform. Capsule oblong, glabrous; carpels 2, membranaceous. Seeds dark, compressed, subtriangular, pitted-wrinkled.

? *Dissecocarpus polygamus* var. *latifolia* Hassk. Commelin. Ind. p. 10.

Nom. Jap. *Ōba-bōshibana*, *ōbōshi*, *ō-utsushibana*, *kon-ya-tarō*, *aobana*.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (Herb.! Sc. Coll. Imp. Univ. Tokyo, July 19, 1879; *T. Makino!* Aug. 1895).

A cultivated form, much larger than the typical one. Blue juice of

their petals is used for dyeing in the manufacture of a kind of blue paper, called *Bōshi-gami*, or *Ai-gami*, which is a famous product of Yamada-Village, Kurimoto-gōri, prov. Ōmi.

Aspidium laserpitifolium Mett. in Ann. Mus. bot. Ludg.-Bat. I. p. 227; tab. 6, fig. III; Miq. Prol. Fl. Jap. p. 340; Hook. et Baker Syn. Fil. p. 254; Franch. et Sav. Enum. Pl. Jap. II. p. 233; Christ Die Frank. der Erde, p. 240.

Rhizome creeping, stout. Stipes distant, shorter than the frond, slender, hard, scaly towards the base, fulvous-stramineous when dried; scales subulate-lanceolate, or often dilated at the base, narrowly acuminate, entire, membranaceous, fulvous-brown, veins very delicate forming copious minute vertical areolæ. Frond light green even when dried, ovate, ovate-deltoid, or ovato-lanceolate, acuminate, tripinnatifid or subtripinnate but bipinnatifid above, 35–55 cm. long, 20–33 cm. broad, flaccidly chartaceous, naked above, but very thinly and minutely scaly beneath; main rachis slender, thinly scaly, stramineous; pinnae laxly and alternately arranged, patulous or erect-patent, about 5 on each side, the lowest one largest, and 8–12 cm. in width, deltoid-lanceolate, but narrowly lanceolate in the superior ones, acuminate, petiolate, the rachis slender, thinly scattered with acuminate linear-subulate small scales; pinnules often laxly arranged, alternate, patulous or erect-patent, shortly pedicellate in the inferior ones, but sessile in the superior ones, oblong-lanceolate or ovate-lanceolate, shortly acuminate in the inferior ones, but acute in the superior ones, obliquely cuneate at the base, the lower largest ones attaining about 9 cm. long, the middle ones about $3\frac{1}{2}$ cm. or less long, deeply pinnatifid into oblong or ovate segments, the lower ones often cut down to the rachis; segments very spinulosely serrulate, but the inferior ones margined with lobules, which are also spinulosely pauci-serrulate, obtuse or acute with a spinulose tip at the apex, the largest one about $2\frac{1}{4}$ cm. long, 11 mm. wide, the costa slightly arcuate outwards; veins free, ascending, the lower ones pinnate, the upper ones forked or simple. Sori more or less loosely arranged, terminating the veinlet, 1–12 to a segment, placed between the costa and margin; indusium orbicular-reniform, membranaceous, entire-margined; sporangia long-pedicellate.

Polystichum laserpitifolium Diels in Engl. et Prantl Die Natürl. Pflanzenfam. I. 4, p. 193.

Nom. Jap. *Midori-kanawarabi*.

Hab. Prov. Tosa: Mt. Hōnokawa (*Y. Yoshinaga!* Oct. 2, 1887).

This fern is well distinguished by its retaining power of green colour even when dried. Mettenius' original example has a too small frond, when compared with ordinary ones growing spontaneously in forested place on mountains of this country.

***Aspidium aristatum* Sw. var. *simplicior* Makino var. nov.**

Stipe slender, longer or shorter than the frond, scaly throughout but much denser so towards the base, stramineous; scales ferruginous-brown or fuscous-brown, linear, hairy-acuminate, intermixed with hairy ones. Frond ovate, abrupt above and with a prolonged acuminate terminal pinna at the apex, subtripinnate, coriaceous in texture, naked and more or less nitid above, more or less minutely scaly towards the costæ of pinnules beneath, viridescens when dried; main rachis slender, scaly; pinnæ 3 to 5 on each side, patulous or erect-patent, laxly placed, shortly petioled, narrowly lanceolate, slightly falcate, acuminate, often albescent at the centre, the lowest one largest and each with a large branch pinna at the base on the outside; pinnules numerous, closely placed, patulous, oblong-lanceolate, slightly falcate, very shortly pedicellate or sessile, obliquely cuneate at the base, obtuse with a spinulose tooth at the apex, spinulosely lobulate-serrulate, the inferior ones usually subpinnate or pinnatifid. Sori copious, larger than those of the typical, arranged nearer the margin than the costa of pinnules.

Hab. Prov. TOSA: Takaoka-gōri (*T. Makino!* 1884, 1889), Tokano (*T. Makino!* May 18, 1889.), Yasui (*Y. Yoshinaga!* herb. Sc. Coll. Imp. Univ. Tokyo); Prov. IYO: Nametoko (*Z. Umemura!* June 28, 1896); Prov. ISE: Hikawa-mura in Ichishi-gōri (*Z. Umemura!* Oct. 13, 1895).

It has the simpler form than the type, and in appearance it is like *Aspidium amabile* Blume.

***Nephrodium Filix-mas* Rich. var. *polylepis* Makino.**

Aspidium polylepis Franch. et Sav. Enum. Pl. Jap. II. pp. 236, 631. Nom. Jap. *Miyama-kumavarabi*.

Hab. Prov. SHINANO: Mt. Ondake (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 27, 1880); Prov. SURUGA: Mt. Fuzi (*R. Yatabe* and *Z. Matsumura!* herb. l. c. July 25, 1881); Prov. BUZEN: Mt. Inugadake (*Z. Matsumura!* herb. l. c. July 18, 1882); Prov. ECHIGO: Mt. Haruna (*R. Yatabe!* and *S. Ōkubo!* herb. l. c. July 17, 1886); Prov. MUSASHI: Mt. Yōkami (*T. Makino!* July 16, 1888), Mt. Bukō (*T. Makino!* July 20,

1888); Prov. Iyo: Mt. Ishidzuchi (*S. Yano!* Aug. 1888), Mt. Wariishi (*R. Yatabe!* herb. l. c. Aug. 11, 1888); Prov. Tosa: Nanokawa (*T. Makino!* Nov. 1884), Oku-nanokawa (*T. Makino!* herb. l. c. June 10, 1885).

Phyllostachys mitis A. et C. Rivière Les Bamb. p. 231, figs. 22, 23; Bean in Gard. Chron. 3rd Ser. XV. 1894, p. 369; F.-Mitf. Bamb. Gard. p. 117; Makino in Bot. Mag., Tokyo, XIV. p. 64, et in Descr. d. Prod. forest. d. Jap. exp. Exposit. univ., Paris, p. 39; Satow in Trans. Asiat. Soc. Jap. XXVII. 3, p. 35. cum tab.

Rhizome widely creeping. Culm erect, attaining about 12 m. or more in height and about 2 decim. or more in diameter, terete, broadly grooved above, but semiterete in the uppermost portion, fistulose, smooth, green or yellowish; internodes short; nodes slightly prominent, but more turgid above, pubescent and ringed with white waxy substance below it when young; main-branches 2 to a culm-node, semiterete, turgid at nodes, branchlets usually 1 to 2 to a node. Culm-sheath large, coriaceous, densely pubescent with brown-purple hairs, fimbriate at the top, with a subulate microphyll. Leaves dense, usually 2-8 to a branchlet, lanceolate or angustato-lanceolate, gradually acuminate, shortly attenuated at the base and decurrent to a short petiole, 4-12 cm. long, 5-17 mm. broad, scabrous-margined, chartaceous, green above, more or less pallid beneath, glabrous, but pubescent at the base beneath; midrib slender; veins 3-6 on each side; venules very finely tessellate; ligule produced, ovate, obtuse-truncate and ciliated at the apex, more or less puberulent on the back; sheath narrowly terete, often more or less puberulent above, striate, ciliato-margined, with deciduous fimbriate cilia at the mouth. Spikes numerous and often more or less dense, narrowly lanceolato-cylindrical, acuminate at the apex, about 5-7 cm. in length, secundly and densely and fasciculately flowered, pedunculate; rachis slender, semiterete, very slightly flexuous, finely pubescent, internodes 3-6 mm. in length; peduncles slender, terete, glabrous, internodes short, nodes very slightly prominent, sheaths deciduous. Bracts narrowly oblong or oblong-lanceolate, spathiform, the largest one about 2½ cm. long except the acuminate and lanceolate microphyll at the top, glabrous, or pubescent towards the margin, membranaceous, many-nerved, those of the secondary rachises smaller; bracteoles shorter than bracts, narrowly lanceolate, acuminate, membranaceous, bicarinate, pilose with spreading hairs along the carinæ. Spiculæ erect, very shortly pedicellate, linear-cylindrical, 25-29 mm. long, 1-flowered with a terminal rudimentary

flower, 3-spiculiferous in the lower secondary rachises of the spike; rachilla clavate, finely pubescent, nearly 3 mm. long. Flower erect, linear-cylindrical, gradually attenuated above sharply, viridescent, 22–86 mm. long. Empty glume 1, situated at a short distance below the flowering glume, encircling the flowering-glume and palea, and shorter than them, oblong-lanceolate, with a linear-lanceolate small rudimentary leaf (or microphyll), chartaceo-membranaceous, ciliated and more or less pubescent towards the margin, many-nerved. Flowering-glume convoluto-cylindrical, lanceolate, acuminate with a hispid-spinescent tip, rigidly chartaceous, viridescent, piloso-pubescent, about 10–11-nerved, the transverse venules very delicate and loose. Palea slightly shorter than the flowering-glume, convoluto-linear-cylindrical, linear-lanceolate, attenuated above, bifid with scabro-hispid spinescent lobules at the apex, chartaceous, greenish, thinly pubescent on the dorsal surface, more or less closely and obtusely bi-carinate on the back, forming a very shallow and narrow groove between the carinae, about 11-nerved, the transverse venules very delicate and loose. Lodiculae 3, lanceolate, acuminate, $6\frac{1}{2}$ –7 mm. long, thinly membranaceous, minutely ciliated on the margin, very thinly pubescent in the outside; vertically pluri-nervate below. Stamens 3, exerted; filament long, filiform, glabrous; anther linear, bifid at the base and usually acutish at the apex, pale yellow. Pistil nearly 2 cm. long; ovary oblong-cylindrical, glabrous, shorter than the lodiculae; styles connate, glabrous, the base very thick and suddenly attenuated above; stigmas 3, delicately filiform, much longer than the style, laxly plumose. Caryopsis unknown.

Bambusa mitis Hort. ex Carr. in Rev. Hortie. 1866, p. 380.

Bambusa edulis Carr. l. c.

Phyllostachys edulis A. et C. Rivière Les Bamb. p. 231.

Bambos mosoo Sieb. Syn. Pl. Oeconom. Jap. p. 5.

Bambusa mosoo Zoll. Syst. Verg. I. p. 57.

Nom. Jap. *Mōsō-chiku*.

Hab. Prov. MŪSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ. (Herb! Sc. Coll. Imp. Univ. Tokyo; *T. Makino!* Jan. 1900), Mogusa (*T. Makino!* May 27, 1894), Arai-mura (*T. Makino!* September 1896), Okusawa (*T. Makino!* June 10 and August 28, 1900), Kami-shirane (*T. Makino!* March 21, 1901).

I was fortunate enough to find and examine the flowers, which are extremely rare in this country.

Var. heterocycla Makino in Bot. Mag., Tokyo, XIII. 1899, p. 267,

XIV. p. 64, et in Descr. d. Prod. forest. d. Jap. exp. Exposit. univ., Paris, p. 39.

Culm smaller than the *typica*, the lower nodes alternately oblique in very remarkable manner and then the internodes much shortened and usually more or less turgid. Others as in the *typica*, but flowers yet unknown.

Bambusa heterocycla Carr. in Rev. Hortie. 1878, p. 354; Bean in Gard. Chron. 3rd Ser. XV. p. 368.

Phyllostachys heterocycla F.-Mitf. Bamb. Gard. p. 160, cum icon; Satow in Trans. Asiat. Soc. Jap. XXVII. 3, p. 59.

Nom. Jap. *Kikkō-chiku*.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ. (Herb.! Sc. Coll. Imp. Univ. Tokyo; *T. Makino!* Nov. 17, 1894), Yoyogi (*T. Makino!* Feb. 1, 1901).

The origin of this variety is undoubtedly *Phyllostachys mitis* A. et C. Rivière, or *Mōsō-chiku*.

Coptis (*Chrysocoptis*) **japonica** (Thunb.) Makino in Bot. Mag., Tokyo, XIII. 1899, p. 198.

Didynamista Salvia similis Thunb. Fl. Jap. p. 364, Pl. Obscur. n. 74.

Thalictrum japonicum Thunb. in Trans. Linn. Soc. II. p. 337; Willd. Sp. Pl. II. p. 1303; Pers. Syn. Pl. II. p. 101; DC. Syst. Veg. I. p. 187.

Coptis apiifolia Sieb. in Herb. Lugd. Bat. ex Hoffm. et Schult.

Coptis chrysanthemifolia Sieb. in Herb. Lugd. Bat. ex Hoffm. et Schult.

Coptis racemosa Sieb. Herb. ex Miquel.

Coptis asplenifolia Hoffm. et Schult. Noms indig. Pl. Jap. p. 30, non Salisb.

Coptis anemonæfolia Sieb. et Zucc. Fl. Jap. fam. nat. in Abhandl. Akad. Muench. IV. 2, p. 180, n. 329; Hoffm. et Schult. l. c.; Miq. Prol. Fl. Jap. p. 195; Franch. et Sav. Enum. Pl. Jap. I. p. 10; Huth in Engl. Bot. Jahrb. XVI. p. 303; Id. in Bull. Herb. Boiss. V. p. 1086; Lévêil. in Bull. Acad. Intern. Geogr. Bot. 1900, p. 217.

Coptis anemonæfolia var. *dissecta* Yatabe in Herb. Sc. Coll. Imp. Univ. Tokyo, et in Bot. Mag., Tokyo, VI. 1892, p. 96.

Coptis brachypetala Sieb. et Zucc. l. c. n. 328; Miq. l. c. p. 196; Franch. et Sav. l. c. p. 11; Huth in Engl. Bot. Jahrb. XVI. p. 304; Id. in Bull. Herb. Boiss. V. p. 1087.

Coptis brachypetala var. *major* Miq. l. c. p. 196; Franch. et Sav. l. c. p. 11; Huth in Engl. Bot. Jahrb. XVI. p. 305.

Coptis brachypetala γ. *pygmaea* Miq. l. c.; Franch. et Sav. l. c.; Huth in Engl. Bot. Jahrb. XVI. p. 305.

Coptis occidentalis Miq. l. c. p. 195; Franch. et Sav. l. c. p. 10, non Torr. et Gray.

Coptis occidentalis Huth in Engl. Bot. Jahrb. XVI. p. 303, ex parte.

Coptis occidentalis var. *japonica* Huth in Bull. Herb. Boiss. V. p. 1086.

Coptis orientalis Maxim. in Mém. Biol. VI. p. 259; Franch. et Sav. l. c. p. 10; Huth in Engl. Bot. Jahrb. XVI. p. 305; Id. in Bull. Herb. Boiss. V. p. 1087.

Nom. Jap. *Ōren*.

Hab. Prov. TOSA: Kōchi, cult. (*K. Naganuma!* April 1, 1886); Prov. RIKUCHŪ: Mt. Kurikoma (*T. Makino!* Aug. 1890); Prov. UGO: Zyōzenzi-mura, on mountain (*I. Satō!* April 14, 1892); Prov. UZEN: Foot of Mt. Kimbō-zan (*T. Nagasawa!* April 15, 1894); Prov. AWA (= Bōshū): Mt. Kiyosumi (*T. Makino!* April 8, 1896, April 1898); Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (*Herb.!* Sc. Coll. Imp. Univ. Tokyo, Feb. 23 and June 9, 1880; *T. Makino!* April 1890, March 1893, March 21 and April 29, 1896, March 1897); Hokkaidō (*Herb.!* l. c.); Prov. SHIMOTSUKE: Mt. Nikkō (*K. Sawada!* herb. l. c. June 14, 1878); Prov. SHINANO: Foot. of Mt. Komagadake (*R. Yatabe!* herb. l. c. Aug. 2, 1880); Prov. KAGA: Mt. Hakusan (*B. Yatabe* and *Z. Matsumura!* herb. l. c. Aug. 6, 1881).

A polymorphic species; as to the manner of division of its leaves, we find all gradation from the simply ternate form to the subquadraternatisected form; so no sharp line can be drawn between those forms with various leaves and it is impossible to make from these forms more than one species. Flowers are alike in all.

Tamarix chinensis Lour. Fl. Cochinch. ed. Willd. p. 228; Spreng. Syst. Veg. I. p. 343; DC. Prodr. III. p. 96; Bunge Enum. Pl. Chin. boreal. p. 28; Id. Tent. Gen. Tamaric. p. 46; Hook. et Arn. Bot. Beech. Voy. p. 186; Maxim. Index Fl. Pekin. in Prim. Fl. Amur. p. 471; Id. Enum. Pl. Mongol. I. p. 111; Miq. Prol. Fl. Jap. p. 212; Franch. et Sav. Enum. Pl. Jap. I. p. 54; Debeaux Fl. Tien-tsin p. 20; Bretschn. Early Res. p. 138; K. Ito et H. Kaku Ic. et Descr. Pl. Hort. Koishikawa II. tab.

XVI; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 346; Makino in Bot. Mag., Tokyo, XII. p. 373; Ito et Matsum. Tent. Fl. Lutch. I. p. 318.

Tamarix gallica β . *chinensis* Ehrenb.; Walp. Repert. II. p. 116.

Tamarix gallica Willd. herb. ex Bunge.

Tamarix gallica Thunb. Fl. Jap. p. 126, non Linn.

Tamarix indica Bunge Enum. Pl. Chin. boreal. l. c. (forma); Maxim. Ind. Fl. Pekin. in Prim. Fl. Amur p. 471.

Tamarix sp. Hügel. Pl. exsicc. n. 2832, ex Bunge.

Nom. Jap. *Gyoryū*.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (Herb.! Sc. Coll. Imp. Univ. Tokyo, Aug. 1879); Prov. TOSA: Sakawa, cult. (*T. Makino!* 1882, 1889).

Flowers paniced with copious racemes, which are found on young branchlets of this year.

Tamarix juniperina Bunge Enum. Pl. Chin. boreal. p. 28; Id. Tent. gen. Tamaric. p. 46; Walp. Repert. II. p. 117; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 347; Franch. Pl. David. I. p. 54; Maxim. in Act. Hort. Petropol. XI. p. 75; Makino in Bot. Mag., Tokyo, XII. p. 373.

Tamarix chinensis Sieb. et Zucc. Fl. Jap. p. 132, tab. 71, et Fl. Jap. fam. nat. in Abh. Akad. Muench. IV. 2, p. 161, n. 192, non Lour.

Nom. Jap. *Satsuki-gyoryū* (T. Makino).

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (Herb.! Sc. Coll. Imp. Univ. Tokyo; *T. Makino!* June 1899).

Much less common than the preceding. Racemes are found on branchlets of last year.

Phtheirospermum japonicum (Thunb.) Kanitz Anthoph. Jap. 1878, p. 12; Makino in Bot. Mag., Tokyo, XIII. p. 111.

Gerardia japonica Thunb. Fl. Jap. 1784, p. 251, et Icon. Pl. Jap. Decas 5, 1805, tab. X; Pers. Syn. Pl. II. p. 154; Willd. Sp. Pl. III. p. 224; Spreng. Syst. Veg. II. p. 806; Benth. in DC. Prodr. X. p. 519; Schultes Beitr. z. Nomencl. d. Flor. Jap. 1855, p. 3.

Phtheirospermum chinense Bunge; Benth. l. c. p. 539; Walp. Repert. III. p. 391; Maxim. Prim. Fl. Amur. p. 208; Regel Tent. Fl. Ussur. p. 121; Miq. Prol. Fl. Jap. p. 53; Franch. et Sav. Enum. Pl. Jap. I. p.

350; Franch. Pl. David. p. 225; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 204; Palibin Consp. Fl. Koreae in Act. Hort. Petrop. XVIII. p. 168.

Pedicularis Sieb. herb. ex Miquel.

Nom. Jap. *Ko-shiogama*.

Hab. Prov. SHIMOTSUKE: Nikkō (Herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 26 and Oct. 4, 1879); Prov. MUSASHI: Tokyo (*Z. Matsumura!* herb. l. c. Oct. 10, 1881), Dōkwan-yama (*Z. Matsumura!* herb. l. c. Sept. 28, 1879), Nobitome (*S. Ōkubo!* herb. l. c. Sept. 28, 1882), Shibuya (*T. Makino!* 1900); Prov. SHIMOOSA: Kōnodai (*T. Makino!* Oct. 6, 1895); Prov. TOSA: Tosayama-gō (*T. Makino!* Oct. 6, 1892).

Rehmannia lutea Maxim. in Mém. Biol. IX. p. 371; Franch. et Sav. Enum Pl. Jap. I. p. 328.

a. lutea Makino in Bot. Mag., Tokyo, XII. 1898, p. 301.

Corolla pale-yellow, tinged with light purple in the throat.

Nom. Jap. *Shiroya-dziwō*.

Icon. Imuma's Sōmoku-Dzusetsu XI. fol. 64 recto; Honzōkwaï-Buppīn-Mokuroku, Nagoya, 1835, fol. 2 verso.

β. purpurea Makino l. c.

Perennial. Rhizome thick, long, ramose, orange-yellow, with short fibrous roots. Leaves tufted, spreading, petiolate, oblong, obtuse, cuneately attenuated towards the thickish petiole, which is much shorter than the blade, irregularly crenato-dentate, flaccid, thickish, rugose, pubescent-pilose, green, but purpurascens beneath; nerves prominent beneath, the midrib stout, veins 6 to 7 on each side, erect-patulous, veinlets reticulate. Peduncles erect, lateral to the base of the abbreviated main stem, which is already dead and remaining in the flowering time, a few to a stock, attaining about 32 cm. in height, terete, simple, villosa-pilose with patent white glandular hairs, loosely leafy below, leaves oblong, green, tinged with purpurascens colour beneath, glandular-pilose, dentate, obtuse at the base, cuneate and decurrent to a thickish petiole at the base, rugose, flaccid, thickish, with reticulated veins beneath, became smaller above and at length going to lanceolate or broadly lanceolate subsessile and more or less reflexed bracts, which are slightly shorter or longer than pedicels; pedicels patulous-erect, much shorter than the flower, solitary. Flowers 4–13, approximate at first and then racemosely disposed, facing outwards, 4–4½ cm. long. Calyx globoso-campulate, 5-fid, villosa-pilose with patent white glandular hairs, longitudinally

ribbed, light green shaded with purpurascens colour; lobes a little unequal, deltoid, acutish-obtuse, reflexed-patent, shorter than the tube. Corolla pilose; tube tubuloso-infundibuliform, slightly depressed, more or less contracted at the basal portion, longitudinally veined, 3-ribbed on the upper side, with 2 plaits on the lower side, yellow with many purple spots and spotted striae internally, but purple externally, fuscous-purple towards the throat; limb ringent, obliquely 5-partite, much shorter than the tube, light purple, lobes reflexed-patent, those of the upper lip more reflexed, orbicular, rounded or sometimes subretuse at the apex, ciliated. Stamens 4, didynamous, included; filament filiform, glabrous, yellow, minutely purpureo-maculate; anther divergent, with narrowly oblong cells and white pollen. Ovary conico-ovate, glabrous, green, with deep green and thickish disk at the base; style filiform, glabrous, included; stigma divergently 2-partite with short lobes, the lower lobe much broader. Capsule elliptical.

Nom. Jap. *Akaya-dziviō*.

Icon. Iwasaki's Honzō-Dzufu XVII. fol. 2 recto.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (Herb. Sc. Coll. Imp. Univ. Tokyo, 1878, May 2, 1879; *T. Makino*! May 4 and 15, 1896, Oct. 1, 1900, May 1901).

This species which is cultivated for medicinal purpose in Japan, was introduced formerly from China; the *a. lutea* is very rarely found on account of its difficulty of cultivation, while the *β. purpurea* is commoner.

It is perhaps a variety of *Rehmannia glutinosa* Libosch, which I will call by a new name of *R. glutinosa* var. *Maximowiczii*, including the two forms of *a. lutea* and *b. purpurea*.

Aconitum volubile Koelle; Willd. Sp. Pl. II. p. 1237; Ait. Hort. Kew. ed. 2, III. p. 323; Pers. Syn. Pl. II. p. 83; Spreng. Syst. Veg. II. p. 621; Poir. Encyc. Suppl. I. p. 115; Reichb. Uebers. Gatt. Acon. p. 40, et Illustr. gen. Acon. tab. XXV; Ledeb. Fl. Ross. I. p. 68, et Fl. Alt. II. p. 281; Maxim. Prim. Fl. Amur. p. 26; Regel Tent. Fl. Ussur. p. 12.

Aconitum ciliare a. oligotrichum DC. Syst. Veg. I. p. 378, et Prodr. I. p. 61; Seringe Monogr. Acon. p. 33.

Aconitum villosum β. flexuosum Reichb. Illustr. gen. Acon. tab. XXVII.

Nom Jap. *Hana-kadzura*.

Hab. Prov. OWARI: Nagoya, cult. (*T. Makino!* Oct. 30, 1894, Aug. 1899).

I have not yet seen it growing wild in Japan:

Wikstrœmia trichotoma (Thunb.) Makino in Bot. Mag., Tokyo, XI. 1894, p. 71.

Queria trichotoma Thunb. Bot. Observ. Flor. Jap. in Trans. Linn. Soc. II. 1794, p. 329, et Icon Plant. Jap. Decas 5, tab. 1; Pers. Syn. Pl. I. p. 112.

Rubia spicis ternis Thunb. Fl. Jap. 1784, p. 357, Pl. Obscur. n. 44.

Stellera japonica Sieb. Synops. Pl. Oeconom. Jap. in Verh. Batav. Genootsch. XII. 1830, p. 22; Meisn. in DC. Prodr. XIV. 2, 550.

Passerina japonica Sieb. et Zucc. Fl. Jap. Fam. Nat. II. in Abh. Akad. Muench. IV. 3, 1846, p. 200; Hoffm. et Schult. Noms indig. pl. Jap. p. 58, et Nouv. éd. p. 41.

Wikstrœmia japonica Miq. Ann. Mus. bot. Lugd.-Bat. III. 1867, p. 134, et Prol. Fl. Jap. p. 298; Franch. et Sav. Enum. Pl. Jap. I. p. 405; Maxim. in Mém. Biol. XII. p. 541.

Nom. Jap. *Ki-kogampi*.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (*T. Makino!* Aug. and Sept. 1895, Oct. 21, 1897).

Polygonum Reynoutria (Houtt.) Makino nom. nov.

Reynoutria japonica Houtt. Natuur. Hist. XXVI. 1777, p. 640, tab. LI. fig. 1.

Polygonum cuspidatum Sieb. et Zucc. Fl. Jap. Fam. Nat. II. in Abh. Akad. Muench. IV. 3, p. 208, no. 731; Meisn. in DC. Prodr. XIV. p. 136; Hoffm. et Schult. Noms indig. Pl. Jap. p. 62; Miq. Prol. Fl. Jap. p. 300; Franch. et Sav. Enum. Pl. Jap. I. p. 402; S. Moore in Journ. Bot. 1875, p. 231; Franch. Pl. David. p. 256; Bot. Mag. tab. 6503; Regel's Gartenfl. 1860, p. 152, tab. 291; Benth. et Hook. fil. Gen. Pl. III. p. 99; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 336; Dammer in Engl. et Prantl Natürl. Pflanzenfam. III. 1 a, p. 29, fig. 13 R.

Polygonum multiflorum Sieb. et Bueg. herb. non Thunb. ex Miquel.

Polygonum Sieboldi Hort. ex Meisn. non Meisn.

Nom. Jap. *Hadori*.

Hab. Prov. SAGAMI: Near Yumoto in Hakone (*T. Makino!* Oct. 7, 1886); Prov. MUSASHI: Tokyo (*T. Makino!* Sept. 26, 1895); Prov. SHIMMOUSA: Shimoshidzu (*T. Makino!* Sept. 10, 1895); Prov. SURUGA: Murayama (*Z. Umemura!* Aug. 29, 1898), Mt. Fuzi (*T. Makino!* Aug. 15, 1899); Prov. SHIMOTSUKE: Mt. Nikko (*T. Makino!* June 9, 1901).

Gilibertia trifida (Thunb.) Makino nom. nov.

Acer trifidum Thunb. Fl. Jap. p. 163; Pers. Syn. Pl. II. p. 418; Willd. Sp. Pl. IV. p. 991; Spreng. Syst. Veg. II. p. 224; DC. Prodr. I. p. 595.

Dendropanax trifidus Makino in Herb. Sc. Coll. Imp. Univ. Tokyo.

Hedera japonica Jungh. 1840; Walp. Repert. II. p. 431.

Textoria japonica Miq. Araliaceæ in Ann. Mus. Bat. Lugd.-Batav. I. p. 12; Id. Prol. Fl. Jap. p. 90; Id. Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 43.

Dendropanax japonicus Seem. Journ. Bot. II. p. 301, et Revis. Heder. p. 27; Benth. et Hook. fil. Gen. Pl. I. p. 944; Franch. et Sav. Enum. Pl. Jap. I. p. 194; Kanitz Anthoph. Jap. p. 28; Clarke in Hook. fil. Fl. Brit. Ind. II. p. 733; Engl. in Engl. Bot. Jahrb. VI. p. 61; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 342.

Gilibertia japonica Harms in Engl. et Prantl Nat. Pflanzenf. III. 8, p. 41; Matsum. in Bot. Mag., Tokyo, XII. p. 68; Ito et Matsum. Tent. Fl. Lutch. I. p. 538.

Croton japonicum Thunb. herb. sed non Fl. Jap. p. 270, ex Miquel.

Fatsia? mitsde de Vriese Tuinbouw-Flora III. 1856, p. 287; Id. in Sieb. et de Vriese Ann. Hort. et Bot. ou Fl. Jard. Roy. Pays-Bas, I. 1858, p. 6.

Aralia mitsde Sieb.; Sieb. et de Vriese loc. cit. p. 186, cum tab.

Nom. Jap. *Kakuremino*.

Hab. Prov. KIU: Wakano-ura (*Z. Matsumura* and *S. Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, January 3, 1879); Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ. cult. (Herb. ! l. c. Nov. 26, 1879, Sept. 7, 1880); Prov. INZU: Isl. Nii-zima (*S. Ōkubo!* herb. l. c. April 23, 1887); Prov. TOSA: Saga (*T. Makino!* Aug. 1889), Beppu (*T. Makino!* Nov. 1892).

Buckleya Joan (Sieb.) Makino in Bot. Mag., Tokyo, XII. 1898, p. 401.

Calycopteris Joan Sieb. Syn. Pl. Oeconom. Jap. 1827, p. 23.

Quadriala lanceolata Sieb. et Zucc. Fl. Jap. Fam. Nat. in. Abh. Akad. Muench. IV. 2, p. 195, n. 404, tab. II. fig. B; Hoffm. et Schult. Noms indig. Pl. Jap. p. 66.

Buckleya lanceolata Miq. Cat. Mus. Bot. Lugd.-Batav., Fl. Jap. p. 79; Franch. et Sav. Enum. Pl. Jap. I. p. 407.

Puckleya Quadriala Benth. et Hook. fil. Gen. Pl. III. p. 227; Hieron. in Engl. et Prantl Natür. Pflanzenfam. III. 1, p. 220.

Nom. Jap. *Tsukubane*.

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (Herb.! Sc. Coll. Imp. Univ. Tokyo, June 20, 1878; *K. Sawada!* herb. l. c. Oct. 8-9, 1879; *Z. Matsumura!* herb. l. c. August 14, 1885; *T. Makino!* Aug. 1884, June 1901); Prov. IWASHIRO: Aidzu (*Z. Matsumura!* herb. l. c. Aug. 3, 1879), Mt. Shinobu (*K. Nemoto!* July 8, 1894, May 7, 1896); Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *Z. Matsumura!* herb. l. c. July 12, 1884); Prov. ECHIGO: Ideyu-mura (*R. Yatabe* and *S. Okubo!* herb. l. c. Aug. 1, 1886); Prov. YAMASHIRO: Mt. Iiei (*T. Makino!* Nov. 6, 1894); Prov. HITACHI: Mt. Tsukuba (*T. Makino!* May 1897, May 1900); Prov. MUSASHI: Nakatsugawa (*T. Makino!* July 18, 1888).

Aletris spicata (Thunb.) Franch. Journ. d. Bot. X. p. 199; Diels in Engl. Bot. Jahrb. XXIX. p. 240.

Hypoxis spicata Thunb. Fl. Jap. p. 136.

Hypoxis farinosa Thunb. in Transact. Linn. Soc. II. p. 334, non Linn.

Aletris japonica Lambert in Transact. Linn. Soc. X. 1811, p. 407; Miq. Prol. Fl. Jap. p. 324; A. Gray in Perry's Exp. p. 320; Id. Bot. Jap. p. 417; Franch. et Sav. Enum. Pl. Jap. II. p. 46, non Thunb. nec Houtt.

Nom. Jap. *Sokushin-ran*.

Hab. HIZEN: Nagasaki (Herb.! Sc. Coll. Imp. Univ. Tokyo, May 12, 1879); Prov. HYŪGA: Mt. Kirishima (*R. Yatabe* and *Z. Matsumura!* herb. l. c. Aug. 4, 1882); Prov. IDZU: Mt. Ōmuro (*S. Okubo!* herb. l. c. June 4, 1883); Prov. AWA in Shikoku: Yamashirodani-mura (*R. Yatabe!* herb. l. c. July 22, 1888); Prov. SŪŌ: Ōchi-mura (*D. Nikoi!* herb. l. c. June 11, 1891); Prov. TOSA: Sakawa, etc. (*T. Makino!* 1885, etc.)

Liriope minor (Maxim.) Makino in Bot. Mag., Tokyo, VII. 1893. p. 323.

Ophiopogon spicatus *δ minor* Maxim. in Mém. Biol. VII. p. 324; Franch. et Sav. Enum. Pl. Jap. II. p. 84.

Liriope graminifolia var. *minor* Maxim. ex Baker in Journ. Linn. Soc. XVII. p. 500.

Nom. Jap. *Hime-yaburan*.

Hab. Prov. HYŪGA: Mimitsu (*R. Yatabe* and *Z. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, July 26, 1882); Prov. SAGAMI: Hakone (*S. Ōkubo*! herb. l. c. Dec. 31, 1886), Hiratsuka (*T. Makino*! June 24, 1900); Prov. MUSASHI: Shimura (*T. Makino*! Sept. 1893), Koiwa-mura (*T. Makino*! June 23, 1895); Prov. TOSA: Ogawa (*T. Makino*!), Sakawa (*T. Makino*! 1885, July 26, 1887, Dec. 1891), Chōzuya (*T. Makino*! Nov. 1892), Tokano-tōge (*T. Makino*! Aug. 9, 1887), Asakura (*T. Makino*! Sept. 1892); Prov. UGO: Fukiura (*I. Satō*! July 1893).

Arnica unalaskensis Less.; DC. Prodr. VI. p. 317; Torr. et Gray Fl. Bor. Amer. II. p. 451; Ledeb. Fl. Ross. II. p. 622; Herd. Pl. Radd. III. 2, p. 110; A. Gray Synopt. Fl. N. Amer. I. 2, p. 383; Makino in Bot. Mag., Tokyo, XI. 1897, p. 381.

Arnica Langsdorffiana Fisch. in herb. ex Herder.

Arnica angustifolia Franch. et Sav. Enum. Pl. Jap. I. p. 245; Matsum. Cat. Pl. Herb. Coll. Sc. Imp. Univ. Tokyo, 1886, p. 105, non Vahl.

Nom. Jap. *Usagi-giku*, *kinkuruma*.

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (*R. Yatabe*! herb. Sc. Coll. Imp. Univ. Tokyo, July, Aug. 2, 1877; *S. Ōkubo*! herb. l. c. Aug. 21, 1890); Prov. SHINANO: Mt. Komagadake (*R. Yatabe*! herb. l. c. Aug. 2, 1880; *R. Yatabe* and *Z. Matsumura*! herb. l. c. July 12, 1884), Mt. Togakushi (*S. Matsuda*! July 28, 1893); Prov. KAGA: Mt. Hakusan (*R. Yatabe* and *Z. Matsumura*! herb. l. c. Aug. 8, 1881); Hokkaidō (*I. Baehmer*! herb. l. c.).

Arnica Mallotopus (Franch. et Sav.) Makino in Bot. Mag., Tokyo, XI. 1897, p. 381.

Mallotopus japonicus Franch. et Sav. Enum. Pl. Jap. II. p. 394; Yatabe in Bot. Mag., Tokyo, VII. p. 207, tab. VIII; Hoffm. in Engl. et Prantl Natür. Pflanzenfam. IV. 5, p. 291.

Nom. Jap. *Chōzi-giku*.

Hab. Prov. SHINANO: Mt. Idzuna-yama (Herb.! Sc. Coll. Imp. Univ. Tokyo); Prov. ECHIGO: Mt. Myōkō-zan (*S. Hori*! herb. l. c. Oct. 5, 1892). Mt. Shimidzu-tōge (*T. Makino*! Sept. 1888); Prov. RIKUCHŪ: Mt. Kurikoma (*T. Makino*! Aug. 1890).

Although the head is homogamous, this species should be referred, on account of all the other habits, to the genus *Arnica*.

Juglans Sieboldiana Maxim. var. **cordiformis** Makino in Bot. Mag., Tokyo, IX, 1895, p. 313.

Juglans cordiformis Maxim. in Mém. Biol. VIII. p. 635, cum icone fructus; Franch. et Sav. Enum. Pl. Jap. I. p. 453.

Nom. Jap. *Otafuku-gurumi*, *hime-gurumi* (forma).

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (*T. Makino!* herb. Sc. Coll. Imp. Univ. Tokyo, June 1895).

Calystegia sepium R. Br.

Convolvulus sepium Linn. Sp. Pl. p. 153.

Nom. Jap. *Hiroha-hirugao* (*T. Makino* nom. nov.).

Hab. Prov. ISHIKARI in Hokkaidō: Sapporo (*Y. Tokubuchi!* herb. Sc. Coll. Imp. Univ. Tokyo, July 7, 1891).

This is found in Hokkaidō (Ezo). The flower accords with the American variety *C. sepium* β. *rosea* Choisy in DC. Prodr. IX. p. 433 (= *Convolvulus sepium* β. *americanus* Sims in Curtis's Botanical Magazine tab. 732) in colour.

Var. japonica (Thunb.) Makino in Bot. Mag., Tokyo, IX. 1895, p. 312.

Convolvulus japonicus Thunb. Fl. Jap. p. 85; Willd. Sp. Pl. I. p. 849; Spreng. Syst. Veg. I. p. 602.

Ipomœa japonica Pers. Syn. Pl. I. 1805, p. 184.

Calystegia japonica Choisy in Zoll. Syst. Verz. Ind. Archip. Pl. II. p. 132; Miq. Prodr. Fl. Jap. pp. 26, 142, 360; Franch. et Sav. Enum. Pl. Jap. I. p. 331; Kanitz Anthoph. Jap. p. 10.

Ipomœa filicaulis Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abhandl. Akad. Muench. IV. 3, p. 148, n. 510; Hoffm. et Schult. Noms indig. Pl. Jap. p. 45, non Blume.

Kos et *Kudsi*, vulgo *Firagáwo* Kæmpf. Amœn. exot. p. 856.

Nom. Jap. *Hirugao*.

Hab. Prov. MUSASHI: Ōmiya-hachiman (*R. Yatabe* and *Z. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 6, 1879), Koiwa (*T. Makino!* June 23, 1895), Komaba (*T. Makino!* Aug. 12, 1891); Prov. IWAHURO: Aizdu (*Z. Matsumura!* herb. l. c. Aug. 4, 1879); Prov. MUTSU: Mt. Iwaki (*T. Iwagawa!* herb. l. c. July 24, 1880); Prov. SHIZANO: Nandyō (*R. Yatabe*

and *Z. Matsumura!* herb. l. c. July 8, 1884), Mt. Ōmine (*R. Yatabe* and *Z. Matsumura!* herb. l. c. July 9, 1884); Prov. SHIMOOSA: Shimoshidzu (*T. Makino!* Sept. 10, 1895); Prov. SHIBESHI: Otaru (*R. Yatabe!* herb. l. c. July 27, 1878); Okushiri (*K. Miyabe* and *Y. Tokubuchi!* herb. l. c. July 27, 1890).

Japanese *Ō-hirugao* is a larger-leaved form of this variety.

Calystegia hederacea Wall. in Roxb. Fl. Ind. ed. Carey et Wall. II. p. 94; DC. Prodr. IX. p. 434; Miq. Fl. Ind. Bat. II. p. 625; Clarke in Hook. fil. Fl. Brit. Ind. IV. p. 217; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 164; Makino in Bot. Mag., Tokyo, IX. p. 312; Palib. Consp. Fl. Koree in Act. Hort. Petrop. XVIII. p. 164; Diels in Engler's. Bot. Jahrb. XXIX. p. 545.

Convolvulus acetosæfolius Turcz.; Franch. Pl. David. I. p. 218.

Calystegia acetosæfolia Turcz.; Herd. Pl. Radd. IV. 1, p. 215; Maxim. Prim. Fl. Amur. p. 200, et Ind. Fl. Pekin. l. c. p. 475; Regel Tent. Fl. Ussur. p. 115; Hance in Ann. Sc. Nat. 5^{me} sér. V. p. 230; Debeaux Fl. Tient. p. 29; Baker et S. Moore in Journ. Linn. Soc. XVII. p. 384.

Convolvulus Wallichianus Spreng. Syst. Veg. IV. 2, p. 61.

Calystegia pubescens Lindl.; Bot. Reg. 1846, tab. 42; Walp. Repert. VI. p. 541; Van Houtte Fl. des Serres, tab. 172.

Nom. Jap. *Ko-hirugao* (*T. Makino* nom. nov.)

Hab. Prov. TOSA: Sakawa (*T. Makino!* June 1893); Prov. MUSASHI: Tokyo (*R. Yatabe* and *Z. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, May 7, 1877, May 18, 1879; *T. Makino!* July 22, 1893, June 1, 1894, June 1896), Setagaya (*T. Makino!* May 27, 1899), Komaba (*T. Makino!* June 5, 1899).

Blechnum crenulatum (Moore).

Lomaria crenulata Moore, MSS. ex Hook. et Baker Syn. Fil. p. 180, sub *Lomaria Germainii* Hook.

Lomaria Spicant forma blechnoides Baker ex Maxim. in litt.

Blechnum amabile Makino in Bot. Mag., Tokyo, XI. 1897, p. 83.

Nom. Jap. *Osa-shida*.

Hab. Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *Z. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 10, 1884); Prov. ISE: Tochiuki-

dani in Mt. Komono (*S. Ōkubo!* herb. l. c. Aug. 13, 1889); Prov. MUSASHI: Mt. Yōkami (*T. Makino!* July 16, 1888); Prov. Echigo: M. Shimidzu-tōge (*T. Makino!* Sept. 1888); Prov. AWA (Bōshū): Mt. Kiyosumi (*T. Makino!* April 1896); Prov. SAGAMI: Hakone (*S. Matsuda!* Dec. 31, 1893).

Mazus japonicus (Miq.) Makino in Bot. Mag., Tokyo, XI, 1897, p. 391.

Vandellia? *japonica* Miq. Prol. Fl. Jap. p. 50; Franch. et Sav. Enum. Pl. Jap. I. p. 346.

Mazus rugosus $\beta?$ *stolonifer* Maxim. in Mém. Biol. IX. p. 403, 1874.

Mazus rugosus β . *macranthus* Franch. et Sav. Enum. Pl. Jap. I. 1875, p. 344.

Mazus rugosus γ . *rotundifolia* Franch. et Sav. l. c.

Mazus stolonifer Makino in List of Seeds, Bot. Gard. Imp. Univ. Tokyo, 1896, p. 17.

Nom. Jap. *Sagi-goke*, *hazena*.

Hab. Prov. MUSASHI: Tokyo (*R. Yatabe* and *Z. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, April 1879; *T. Makino!* April, 1894, April and May 9, 1896, April, 25, 1899), Shimoshakushii (*T. Makino!* April 15, 1894), Shimura (*T. Makino!* April 14, 1894, April 27, 1899), Noborito (*T. Makino!* May 6, 1894), Ōmiya-hachiman (*T. Makino!* May 15, 1901); Prov. TOSA: Sakawa (*T. Makino!* May 1889); Prov. IYO: Yunoyama (*Z. Umemura!* April 1896); Prov. SUŌ: Ōchimura (*D. Nikai!* herb. l. c. April 25, 1892).

Var. albiflora Makino in Bot. Mag., Tokyo, XI. p. 391.

Nom. Jap. *Sagi-shiba*.

Hab. Prov. SAGAMI: Wada-mura (*M. Miyoshi!* herb. Sc. Coll. Imp. Univ. Tokyo, April 1, 1887); Prov. MUSASHI: Idzumi in Kita-Tama-gōri (*T. Makino!* May 6, 1894); Prov. AWA (Bōshū): Nagasa-gōri (*T. Makino!* April 1896).

A white-flowered form; it is often found in fields.

Adonis amurensis Regel et Radde.

a. uniflorus Makino.

Adonis amurensis Regel et Radde Bot. Abtheil. Radde Reis. Sud. Ost-Sibir. I. 1861, p. 35, tab. II. fig. 1, 2, a; b.; Fr. Schm. Reis. im

Amurl. u. Ins. Sachal. pp. 30, 104; Franch. et Sav. II. p. 266; Hemsl. in Gard. Chron. 3rd Ser. II. 1887, p. 491; Korsh. in Act. Hort. Petrop. XII. p. 296; Bot. Mag. tab. 7490; Huth in Bull. Herb. Boiss. V. p. 1077, excl. syn.; Léveil. in Bull. Acad. Internat. Geogr. Bot. 1900, p. 215.

Adonis apennina var. *dahurica* Maxim. Prim. Fl. Amur. 1859, p. 19; Miq. Prol. Fl. Jap. p. 191; Franch. et Sav. l. c. I. p. 6, non Ledeb.

Adonis sibirica Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abh. Akad. Muench. IV. 2, p. 179; Hoffm. et Schult. Noms indig. Pl. Jap. p. 15, non Patrin.

Nom. Jap. *Fukuzyu-sō*.

Hab. Prov. ISHIKARI in Hokkaidō (Ezo): Sapporo (Herb. ! Sc. Coll. Imp. Univ. Tokyo; *Y. Tokubuchi!* May 26, 1887, comm. *K. Miyabe!*); Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ. cult. (Herb. ! l. c. Jan. 1881), Shimonaguri in Chichibu, cult. (*T. Makino!* April 6, 1895); Prov. BUNGO in Isl. Kyūshū (Kiusiu): Kambara in Minami-Tateishi-mura (*N. Okada!* April 20, 1889); Prov. TOSA: Sakawa, cult. (*T. Makino!* 1885).

Var. β . ramosus (Franch.) Makino.

Adonis ramosus Franch. 1894; Huth l. c. Léveil. l. c.

Nom. Jap. *Edauchi-fukuzyusō* (nom. nov.).

Hab. Prov. ISHIKARI in Hokkaidō: Sapporo (*K. Miyabe!* herb. l. c. April 1878; *Y. Tokubuchi!* May 26, 1887, comm. *K. Miyabe!*); Prov. MUSASHI: Tokyo, cult. (*T. Makino!* March 1897), Id. Bot. Gard. Sc. Coll. Imp. Univ. cult. (Herb. ! l. c.).

I can detect no sufficient difference separating specifically *Adonis ramosus* Franch. from *A. amurensis* Regel et Radde. In Japan, these two varieties bear a common name of *Fukuzyu-sō*, though various horticultural names are given on their garden forms. The typical uniflorous variety extends southward as far as the province of Bungo in Isl. Kyūshū, as cited above.

Potentilla fruticosa Linn. var. **glabrata** (Willd.) Makino.

Potentilla glabrata Willd. 1813.

Potentilla glabra Lodd.; DC. Prodr. II. p. 584; Ledeb. Fl. Alt. II. p. 234, in nota; Id. Fl. Ross. II. p. 62; Bot. Mag. tag. 3676.

Potentilla davurica Nestl. 1816; Hance in Journ. Linn. Soc. XIII. p. 79.

Potentilla fruticosa β . *dahurica* Ser. in DC. Prodr. II. p. 579.

Potentilla fruticosa alba Busch.

Nom. Jap. *Ginro-bai*.

Hab. Prov. Awa in Isl. Shikoku: Mt. Tsurugi-san (*M. Shirai!* herb. Sc. Coll. Imp. Univ. Tokyo, August 13, 1898; *Ōyatsu!* herb. l. c.).

Very rare in Japan.

Sibbaldia procumbens Linn. Sp. Pl. p. 284; Gärtn. Fruct. et Semin. Pl. I. 1788, p. 348, tab. LXXIII. fig. 5; Pers. Syn. Pl. I. p. 340; Spreng. Syst. Veg. I. p. 956; Willd. Sp. Pl. I. p. 1567; Ait. Hort. Kew. ed. 2, II. p. 199; DC. Prodr. II. p. 587; Ledeb. Fl. Alt. I. p. 428; Id. Fl. Ross. II. p. 32; Nyman Syll. Fl. Eur. p. 273; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 192; A. Gray Man. Bot. ed. 5, p. 153; Benth. Handb. Brit. Fl. ed. 5, p. 139; Focke in Engl. et Prantl Natur. Pflanzenfam. III. 3. p. 36; Diels in Engler's Bot. Jahrb. XXIX. p. 404.

Potentilla procumbens Clairv. non Sibth.

Potentilla Sibbaldi Hall. f.; Hook. Fl. Brit. Ind. II. p. 345; Makino in Bot. Mag., Tokyo, XII. 1898, p. 89.

Potentilla Sibbaldia Griessel.; Swerby's Engl. Bot. ed. 3, III. p. 142, tab. CCCXXVI.

Dactylophyllum Sibbaldia Spenn.

Potentilla Sibbaldiana Lehm.

Sibbaldia octopetala Mill.

Sibbaldia cuneata Hornem.; Edgew. in Trans. Linn. Soc. XX. p. 44.

Sibbaldia parviflora Willd.; Pers. l. c.; Spreng. l. c.; DC. l. c.

Sibbaldia foliolis tridentatis Gmel. Fl. Sib. III. p. 186, Nr. 41.

Nom. Jap. *Tateyama-kimbai* (T. Makino).

Hab. Prov. Ercnu: Mt. Tate-yama (Herb. *T. Makino*, Aug. 1890, communicat. by *T. Ichimura* of Fourth High School in Kanazawa).

Very rare in Japan.

DRYMOTÆNIUM Makino gen. nov. (*Tenitidince—Polypodiaceae—Polypodiaceae.*)

Sori much elongated, linear, simple, continuous, rarely sub-interrupted at base, lying in a groove between the costa and the margin in the upper half portion of the frond and parallel with it, forming two equal lines, intermixed with peltate paraphyses. Indusium none. Veins immersed, irregularly anastomosing, with or without free veinlet within the areoles.

Epiphytic Fern. Rhizome creeping, with scales. Fronds simple, uniform, linear, elongated, carnose, costate, articulated at the base, most-

ly soriferous, the soriferous portion similar to the sterile portion in shape.

A monotypic genus. Quite the habit of *Vittaria*, and it is to be distinguished from that genus principally by the anastomosing venation, peltate paraphyses, and articulated bases of the fronds. Its nearest affinity is found in *Drymoglossum*, but fronds of the latter are quite dimorphous. *Hymenolepis*, in which the soriferous portion of the frond is contracted, and *Heteropteris*, in which sori are intramarginal on more or less contracted portion of the frond, also apparently differ from the present genus.

(ETYM.) *Drymos*, a forest, and *tainia*, a fillet; the fern inhabits forests and with long narrow fronds.

D. Miyoshianum Makino nom. nov.

Tenitis Miyoshiana Makino in Bot. Mag., Tokyo, XII. 1898, p. 26.

Tenitis sp. Miyoshi, ibidem, III. 1889, p. 351-53, tab. XIII.

Vein-areoles with or without free included veinlet.

For the description the remark, etc., see the Magazine cited above. In the issuing number (Vol. I. No. 12) of my "Phanerogamæ et Pteridophytæ Japonicæ iconibus illustratæ" figures with detail will appear.

Gardneria multiflora Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 53.

Glabrous voluble shrub. Stem slender, cylindrical, smooth, branching, internodes shorter or longer than leaves. Leaves opposite, spreading, shortly petioled, angustato-lanceolate, acuminate, gradually attenuated below, entire and more or less sub-repand, chartaceo-coriaceous, deep-green above, paler beneath, $4\frac{1}{2}$ - $14\frac{2}{3}$ cm. long, $1\frac{1}{2}$ - $3\frac{2}{3}$ cm. broad; midrib slender, prominent beneath; veins delicate, about 6-9 on each side, loose, spreading and at last connect with above one; veinlets not conspicuous; petiole $\frac{1}{2}$ - $1\frac{1}{2}$ cm. long, cylindrical, often curved. Cyme axillary, more or less nutant, much shorter than the leaves but longer than the petiole, 2- $2\frac{1}{2}$ cm. long, with glabrous gracile peduncle, divaricately trichotomous or often again di- or trichotomous with glabrous gracile pedicels; bract minute, subulate, ciliated. Flower small, yellow, 12-13 mm. across, conico-cylindrical in bud, often punctate externally. Sepals 5, minute, unequal in size, imbricated, thick, orbicular, glabrous, but ciliated on the margin, $1\frac{1}{3}$ - $1\frac{1}{2}$ mm. long. Corolla deeply 5-parted, rotate, patent; tube equalling the calyx in length; lobes valvate in bud, narrowly lanceolate, acute, entire, thick, longitudinally 2-carinate on the internal margins, glabrous

externally and internally, $5\frac{1}{2}$ –6 mm. long, $1\frac{1}{2}$ –2 mm. broad. Stamens 5, inserted on the corolla-tube, erect, free and converging (not connate); filament very short; anthers in an ovate-cylindrical, yellow, introrse, lanceolate, attenuated above with an acutish tip, trigonous, bifid at the base, $3\frac{1}{2}$ mm. long, the connective glabrous. Ovary equal to the calyx in height, minute, ovato-globose, glabrous; style erect, filiform, glabrous, 5–6 mm. long, slightly exceed the anther; stigma elliptical, scarcely thick, obscurely 2-lobed, minutely hairy. Berry scarlet.

Hab. Prov. BIRCHŪ: Onaga in Takakura-mura, Kawakami-gōri, in forest on the side of the River Takayana (*Zensuke Yoshino!* July 2, 1901); Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult (Herb. ! Sc. Coll. Imp. Univ. Tokyo, July 10, 1880; *T. Makino!* July 10, 1891, Aug. 11, 1901).

This species is closely allied to the British-Indian *Gardneria ovata* Wall.; but the leaves are more angustate, the flower 5-merous and 5-androus, the corolla-lobes more angustate and acute, and the anthers free although they are convergent. It differs also from *G. nutans* Sieb. et Zucc., which has the single- (? rarely 2-3-) flowered peduncle, white flowers, and more inconspicuous-veined leaves. It is growing wild in the province of Bitchū, as quoted above; Yoshino's specimen which was kindly sent to me, was the first which led me to count this species beyond doubt among the Flora of Japan.

Thujopsis dolabrata Sieb. et Zucc. var. **Hondai** Makino var. nov.

Cones globose, $1\frac{1}{2}$ –2 cm. in diameter, fulvous-brown; scales 6–8, thick, woody, unequal in size, cuneate; apex-face square in the upper ones, but transversely oblong in the lower ones, slightly umbonate in centre.

Nom. Jap. *Hinoki-asunaro* (T. Makino).

Hab. Prov. MUTSU: Near Awomori (Herb. ! Dendr. Inst. Agric. Coll. Imp. Univ. Tokyo, Oct. 1899).

This differs from the typical species by the shape of the cone. It forms a beautiful and great forest near Awomori, etc. (in Prov. Mutsu) in the northern Japan, where it is commonly known under the name *Hinoki*. The wood has the best quality and supplies superior timber, while that of the typical one is distorted and inferior.

I have named it in honour of Dr. Seiroku Honda, Professor of Dendrogy in the Agricultural College, Imperial University of Tokyo.

Sagittaria Aginashi Makino sp. nov.

A glabrous aquatic perennial. Rhizome erect, thick, densely rooting, without any stolon, furnished with small very numerous pedicellate tubercles at the base within petiole-vaginæ. Leaves radical, fasciculate, erect, long-petioled; lamina nearly perpendicular, firmly, herbaceous, thickly membranaceous, strongly nervate, sagittate and 12–38 cm. long, but in the inferior ones often simply lanceolate without the basal lobes, linear to broadly lanceolate, acuminate with a subcallose tip, entire, 2–5-nerved on each side; basal lobes usually shorter than the terminal lobe, directing downwards with a weak diverging degree, linear to lanceolate, gradually acuminate towards a subcallose tip, entire, 2–4 on the outer side and 1–3 on the inner side of the midrib; petiole elongated, semiterete, more or less angulate above, vaginate at the base. Scape erect, higher than the leaves, elongate, terete. Raceme narrow, erect; rachis shorter than the peduncle, subtrigonus-terete, usually not branching; bracts 3-verticillate on nodes, patent, shorter than pedicels, ovato-deltoid or deltoid-subulate, the inferior ones often subulate-lanceolate with an obtuse tip, herbaceo-membranaceous, scarious and crispate towards the margin; pedicels 3-whorled, erect-patent, 8–35 mm. in length, the whorls about 5 to 10 to a rachis and distant one another. Flowers monoecious, the female below and male above. Sepals 3, reflexed in flower, ovato-elliptical to oblong, obtuse, entire, herbaceo-membranaceous, scarious towards the margin, light-green shaded with rose-colour, persistent, about 7–8 mm. long. Petals 3, ample, patent, broadly orbicular, white, deciduous. MALE FLOWER: Stamens numerous, shorter than the sepals, aggregated; filament short, glabrous, linear-oblong; anther elliptical to narrowly oblong, auriculated at the base, extrorse, equalling or longer than the filament in length, basifixed, yellow. FEMALE FLOWER: Rudimentary stamens minute; ovaries numerous, crowded in a spherical head on a globular receptacle, curved upwards and lunato-ovate, laterally much compressed, alate-margined, tapering above towards a short and ascending style and minute stigma. Fruit globose, hardly depressed, accompanied by persistent sepals below, green; the receptacle elevated and globular; carpels very numerous, crowded, laterally much compressed, cuneate, turned upwards and acutely rostrate, more or less striate on both lateral faces, having a rounded and suberistate outer margin. Seed obovato-oblong, compressed laterally, with a hamate embryo.

Sagittaria sagittifolia var. *Aginashi* Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 49.

Hab. Prov. OSHIMA in Hokkaidō: Hakodate (*R. Yatabe* and *K. Miyabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 10, 1878); Prov. IWAKI: Maniwa near Sakamoto in Watari-gōri (*T. Makino!* Aug. 17, 1890); Prov. MIKAWA: Takashi-mura (*T. Makino!* Oct. 29, 1894, Aug. 1899); Prov. SŪō: Ōchi-mura (*D. Nikai!* herb. l. c. Aug. 26, 1892); Prov. MUSASHI: Himonya (*T. Makino!* Aug. 1901).

This species sparingly dispersed over Japan; it is remarkably peculiar by having small numerous tubercules at the base within the vagina of petioles and having no stolon.

***Sagittaria sagittifolia* Linn. forma *sinensis* (Sims) Makino.**

Stout, stoloniferous; stolons long, in its end with a globose tuber which is attaining about 4 cm. or more in diameter. Leaves ample, long-petioled, sagittate, broadly ovate, very slightly produced and obtuse at the apex, the basal lobes usually longer than the terminal lamina, ovate, acuminate with very sharply pointed apex, the sinus close towards the bottom and then open forwards; petiole stout, angulate, vaginate at base. Flower sometimes appeared; rachis branching below.

Sagittaria sinensis Sims Bot. Mag. 1814, tab. 1631; Spreng. Syst. Veg. II. p. 633.

Sagittaria sagittifolia Lour. Fl. Cochinch. p. 570 (ed. Willd. p. 698), ex Sims.

Sagittaria sagittifolia a. edulis Sieb. Syn. Pl. Oecon. Jap. 1830, p. 17; Miq. Prol. Fl. Jap. p. 70.

? *Sagittaria obtusa* Thunb. Fl. Jap. p. 242, excl. nom. Linn.
Nom. Jap. *Kuwai*.

Hab. Prov. MUSASHI: Mikawazima-mura, cult. (*T. Makino!* Sept. 27, 1888), Adzusawa near Akabane, cult. (*T. Makino!* Oct. 30, 1898), Tokyo, cult. (*T. Makino!* Aug. 1901).

This is commonly cultivated throughout Japan for their edible tubers.

***Sagittaria sagittifolia* Linn. var. *pygmæa* (Miq.) Makino.**

Sagittaria pygmæa Miq. Prol. Fl. Jap. p. 70; Franch. et Sav. Enum. Pl. Jap. II. p. 17.

Sagittaria sagittifolia β. *oligocarpa* Micheli in DC. Monogr. Phanerog. III. p. 68.

Hab. Prov. MUSASHI: Tokyo (*R. Yatabe* and *Z. Matsumura!* Oct.

14, 1884), Shimura (*T. Makino!* Oct. 1890, Sept. 7, 1893); Prov. TOSA: Kaida in Nagaoka-gōri (*S. Yano!* herb. l. c. July 25, 1890); Prov. SŪ: Ōchi-mura (*D. Nikai!* herb. l. c. June 16, 1899).

Alisma reniforme Don Prodr. Fl. Nepal. p. 22; Spreng. Syst. Veg. IV. Pers II. p. 144; Kunth. Enum. Pl. III. p. 151; Wight Ic. tab. 322; Benth. Fl. Austral. VII. p. 186; Hook. fil. Fl. Brit. Ind. VI. p. 560; Makino in Bot. Mag., Tokyo, VIII. 1894, pp. 172, 380.

Alisma parnassifolium F. Muell. Fragm. Phyt. Austral. VIII. p. 214, et Sec. Syst. Cens. Austral. Pl. I. 205, non Bassi.

Alisma parnassifolium β . *majus* Micheli in DC. Monogr. Phanerog. III. p. 36.

Alisma calophyllum Wall.

Hab. Prov. KADZUSA: Hongō-mura (Herb. ! Sc. Coll. Imp. Univ. Tokyo, Aug. 13, 1880); Prov. SHIMOOSA: Mama (*T. Makino!* Sept. 1891); Prov. MUSASHI: Negishi in Tokyo (*T. Makino!* Aug. 12 and 17, Sept. Oct. 1888).

Asparagus lucidus Lindl. var. ***pygmæus*** Makino in Bot. Mag., Tokyo, XI. 1897, p. 281.

Densely caespitose, quite glabrous, deep-green, attaining about 38 cm. in height. Roots densely fasciculate, thick and fleshy, oblong-fusiform with long fibrous tails which have short rootlets. Stems herbaceous, erect, slender, angulate, but terete below, branching, assuming a form of narrowly pyramidal in outline; branches ascending or erect-patent, triquetrous above but quadrangular below. Leaves squamiform, deltoid-subulate, membranaceous, minutely spinescent at the base, those of the lower portion of the main stem elliptical-ovate and not spinescent. Cladodes 3-4-nate, unequal in length, erect-patent, acicular, falcate upwards, triquetrous with smooth margins, sharply tapering, $\frac{1}{2}$ - $2\frac{1}{4}$ cm. long, $\frac{3}{4}$ -1 mm. broad. Flower unknown.

Hab. Prov. TOSA: Sakawa, cult (*T. Makino!* Dec. 1892); Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (*T. Makino!* Aug. 1901).

An well-marked variety. It is to be seen only in garden, and they are always sterile, as far as I know; so we are quite ignorant about the flower.

Teucrium veronicoides Maxim. in M&L. Biol. IX. p. 826; Franch. et Sav. Enum. Pl. Jap. II. p. 465.

Teucrium nipponicum Makino in herb. Sc. Coll. Imp. Univ. Tokyo, 1891.

Hab. Prov. ISHIKARI in Hokkaidō: Sunakawa in Sorachi (*K. Miyabe!* Aug. 7, 1891); Prov. MUSASHI: Komaba (*T. Makino!* Aug. 12, 1891).

This species has not hitherto been mentioned from the Hondō (main land) of Japan.

Salvia japonica Thunb.

a. typica Makino in Bot. Mag., Tokyo, XI. 1897, p. 281.

Forma a. bipinnata Makino l. c.

Salvia japonica Thunb. Fl. Jap. p. 22, tab. 5; Pers. Syn. Pl. I. 1805, p. 29; Spreng. Syst. Veg. I. 1825, p. 69; Willd. Sp. Pl. I. p. 150; Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abh. Akad. Muench. IV. 3, p. 157; Benth. in DC. Prodr. XII. p. 354; Walp. Repert. III. p. 675; Miq. Prol. Fl. Jap. p. 40; Hoffm. et Schult. Nom. indig. Pl. Jap. p. 72, et Nouv. éd. p. 53; Engl. et Maxim. in Engler's Bot. Jahrb. VI. p. 66; Foesbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 284.

Salvia japonica γ . *bipinnata* Franch. et Sav. Enum. Pl. Jap. I. p. 372, et II. p. 463.

Hab. Prov. SHIMOTSUKE: Nikkō (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 28, 1877); Prov. IWASHIRO: Yumoto in Aizu (*Z. Matsumura!* herb. l. c. Aug. 1879); Prov. SAGAMI: Mt. Hakone (*R. Yatabe* and *Z. Matsumura!* herb. l. c. July 23, 1881); Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *Z. Matsumura!* herb. l. c. July 10, 1884); Prov. SETSU: Mt. Maya (*R. Yatabe!* herb. l. c. Aug. 15, 1888); Prov. AWA in Isl. Shikoku: Nishiu-mura and Kamimyō-mura (*R. Yatabe!* herb. l. c. July 24, 1888); Prov. MUSASHI: Tokyo (*T. Makino!* Aug. 1893); Prov. MIKAWA: Kaifuku (*G. Nagura!* July 24, 1897); Prov. IYO: Near Matsuyama (*Z. Umemura!* July 25, 1897).

Leaves are often transferred into simply pinnate.

Forma b. ternata Makino l. c.

Salvia japonica β . *ternata* Franch. et Sav. l. c.; Franch. Pl. David. p. 236; Diels in Engler's Bot. Jahrb. XXIX. p. 558.

Salvia diversifolia Miq. l. c.

Salvia Fortunei Benth. in DC. l. c., et Fl. Hongk. p. 277; Hance Fl. Hongk. Suppl. in Journ. Linn. Soc. XIII. p. 117, et in Journ. Bot. 1874, p. 261.

Hab. Prov. MUSASHI: Meguro near Tokyo (*R. Yatabe* and *Z. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, Oct. 26, 1879), Shirako (*T. Makino*! Sept. 23, 1895), Yanaka in Tokyo (*R. Yatabe* and *Z. Matsumura*! herb. l. c. Sept. 12, 1880); Prov. SHINANO: Mt. Mi-take (*R. Yatabe*! herb. l. c. Aug. 8, 1880); Prov. HITACHI (Herb. l. c.); Prov. HYŪGA: Miyakonozyō (*R. Yatabe* and *Z. Matsumura*! Aug. 5, 1882); Prov. MUKAWA: Tsubakidachi in Higashi-Kamo-gōri (*G. Nagura*! Sept. 18, 1897), Kaifuku (*G. Nagura*! July 24, 1897); Prov. SAGAMI: Tsukui (*Y. Muraoka*! Oct. 1888); Prov. TOSA: Ikku (*T. Makino*! Sept. 27, 1892).

They are often passed into simple-leaved one.

Forma c. integrifolia Makino l. c.

Salvia japonica a. integrifolia Franch. et Sav. l. c.; Diels l. c.

Salvia chinensis Benth. in DC. l. c. p. 355; Walp. l. c.

Hab. Prov. MUSASHI: Tokyo (Herb. Sc. Coll. Imp. Univ. Tokyo), Yanaka in Tokyo (*R. Yatabe* and *Z. Matsumura*! herb. l. c. Sept. 12, 1880), Shirako (*T. Makino*! Sept. 23, 1895); Prov. HYŪGA: Miyakonozyō (*R. Yatabe* and *Z. Matsumura*! herb. l. c. July 27, 1882).

In Japan, above mentioned *b. ternata* and *c. integrifolia* are not sufficiently fixed forms, the *integrifolia*-form at length should be passed to the *ternata*-form, and the latter to the typical *bipinnata*-form when fully developed; therefore all the gradations as regard to the divisions of leaves are to be noticed among them.

Var. β. intermedia Makino l. c.

Perennial, 20-80 cm. high. Rhizome subrepent, slender, with fibrous roots at the nodes. Stem erect or ascending, slender, simple, obtusely tetragonous and sulcate in the faces, hispidulous-pilose, with short or long internodes. Leaves opposite, furnished with long and slender petioles, ternately pinnate to bipinnate, thin, thinly pilose above, hispidulous-pilose along nerves beneath, the rachis and petiole hispidulous-pilose with patent hairs; lateral leaflets sessile or very shortly petiolulate, or sometimes apparently petiolulate, but all distinctly petiolulate and larger in the terminal leaflet, ovate, oblong-ovate, elliptical, ovate-lanceolate, or lanceolate, but often orbicular or ovate-orbicular in those of the inferior leaves, the apex obtuse or shortly acuminate with an obtuse point, or sometimes more or less prolonged in the superior, more or less obliquely acute, obtuse rounded-obtuse, or rounded at the base, but obtuse to rounded or truncate or sometimes subcordate at the base in the terminal leaflets, paucilobato-crenate or crenate or serrato-crenate, green above, paler beneath. Raceme terminal or axillary, slenderly stalked, simple, angustate, erect but

erect-patent in the axillary ones; rachis slender, straight, obtusely tetragonous and sulcate in the faces, pubescent with glandular or eglandular hairs; verticillaster loosely disposed, sessile, 6-10-flowered, patent; bract small, lanceolate, the lowest one usually exceed the flower, the upper ones much shorter than the flower and ciliated. Flower small, 8-12 mm. long exclusive of the stamens and style, shortly pedicellate. Calyx oblong-cylindrical and slightly enlarged above, $5\frac{1}{2}$ - $7\frac{1}{2}$ mm. long, hispidulous with patent glandular or eglandular hairs externally and pilose partly internally, 11-nerved being the 5 upper and the 6 lower, unequally shortly bilabiate, the back with 2 longitudinal ciliated narrow wings and a longitudinal middle rib and usually tinged with purple colour; the upper lip entire and obtuse- or acutish-pointed, slightly curved upwards, hardly shorter than the lower lip which is aculeate-bidentate. Corolla deep-violet or pale-lilac, exserted, bilabiate, pilose above externally, annulate with dense and short hairs in the tube internally; the tube cylindrical, slightly exserted, hardly curved upwards; the lip shorter than the tube; the upper lip horizontal, slightly concave within, oblong or elliptical, emarginate; the lower lip more or less shorter than the upper lip, rounded, trilobed, the lateral lobes orbicular or ovato-orbicular, the midlobe larger and longer, broadly and shortly cuneate, truncate or emarginate-truncate at the apex. Stamens long exserted; filament glabrous; the anterior anther-cell linear, coarctate, purple or dark-purple; the posterior abortive anther-cell minute; connective filiform, glabrous; rudimentary stamens 2, minute, included, capitate at the top. Style long, filiform, higher than stamens, glabrous; stigma 2-fid with unequal narrow lobes. Ovary deeply 4 parted, accompanied by a minute rounded disk at the lower side; lobes oblong, glabrous, minute. Nutlets erect, elliptical, compressed, obtusely subtrigonous, smooth, $2\frac{1}{3}$ mm. long.

Hab. Prov. SAGAMI: Mt. Hakone (*R. Yatabe* and *Z. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, July 26, 1881); Prov. MUSASHI: Mt. Bukō (*T. Makino*! July 20, 1888); Prov. HITACHI: Mt. Tsukuba (*C. Ōwatari*! herb. l. c. July 8, 25, 1895); Prov. YAMASHIRO: Mt. Hiei (*N. Takemura*! June 16, 1901).

It may be separable into two forms of *a. crenata* and *b. lobato-crenata*; the former being usually more robust, with broader and crenate leaflets, and usually light-coloured flowers, while the latter being gracile, small and pauci-lobato-crenate leaflets and deep-violet flowers.

Var. 7. *pumila* Franch. et Sav. l. c.; Makino l. c.

Hab. Prov. TOSA: Fumato (*T. Makino*! November 10, 1885), Sakawa, cult. (*T. Makino*! 1887), Ōyashiki in Ogawa-mura (*T. Makino*! May 21,

1889), Akinokawa in Aki-gōri (*T. Makino!* June 3, 1892).

This variety extends to Loochoo Islands southward. The leaves are variable, and the flower is white.

***Vicia sativa* Linn. var. *normalis* Makino** Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 53, et IX. 1895, p. 231.

Leaves without tendril, with an odd leaflet smaller than lateral ones; the latter are more numerous than those of the type. Others as the type.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1889, May 1889), Kōchi (*S. Yano!* July 1888; *T. Makino!* 1892); Prov. SHIMA: Toba (*Z. Umemura!* April 20, 1893); Prov. MUSASHI: Tokyo (*T. Makino!* May 1895, 1900), Tokyo, Bot. Gard. Se. Coll. Imp. Univ. (*Herb.!* Sc. Coll. Imp. Univ. Tokyo, June 10, 1878, April 10, 1880), Chichibu (*R. Yatabe* and *Z. Matsumura!* herb. l. c. April 25, 1878), Shinagawa (*T. Makino!* April 23, 1890); Prov. SHIMOSA: Kaizin-mura (*Herb.!* l. c. May 27, 1885); Prov. HITACHI: Itako (*Y. Suzuki!* May 5, 1901).

This variety is found in field widely spreading over Japan, though less common than the type.

***Dryas octopetala* Linn. Sp. Pl. p. 501; Gærtn. Fruct. et Semin. Pl. I. 1788, p. 352, tab. LXXIV. fig. 2; Pers. Syn. Pl. II. p. 57; Spreng. Syst. Veg. II. p. 527; Willd. Sp. Pl. II. p. 1118; Ait. Hort. Kew. ed. 2, III. p. 281; DC. Prodr. II. p. 549; Ledeb. Fl. Alt. II. p. 267; Id. Fl. Ross. II. p. 20; Hook. Fl. Bor. Amer. I. p. 174; Torr. et Gray Fl. Bor. Amer. I. p. 420; Nyman Syll. Fl. Eur. p. 273; Hook. et Arn. Bot. Beechey's Voy. p. 123; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 182; Regel's Gartenfl. 1860, p. 117, tab. 286, fig. 1; Sowerby's Engl. Bot. ed. 3, p. 201, tab. CCCCLX; A. Gray Man. Bot. ed. 5, p. 151; Benth. Handb. Brit. Fl. ed. 5, p. 132; Focke in Engl. et Prantl Natur. Pflanzenfam. III. 3, p. 38; Makino in Bot. Mag., Tokyo, IX. 1895, p. 388.**

Genm. chamaedryfolium Crantz; *Dryas chamaedryfolia* S. F. Gray; *Dryas chamaedryoides* Pall.; *Dryas alpina* Salisb.; *Dryas depressa* Bab.; *Dryas pentaphylla* Hill.; *Dryas octopetala, foliis simplicibus* Gmel.

Nom. Jap. *Chōnosuke-sō* (*T. Makino*).

Hab. Prov. ETCHŪ: Mt. Tate-yama (*Chōnosuke* [*Tschonoski*] *Sugawa!* Aug. 1889?); Prov. SHINANO: Mt. Akadake in Suwa-gōri (*K. Yazawa!*

Aug. 9, 1897), Mt. Komaga-dake (*S. Hata*, after *K. Yazawa*).

Very rare in Japan. The specimens in my Herbarium are due to the kindness of Mr. Komesaburō Yazawa.

Corylopsis Gotoana Makino sp. nov.

Small tree. Branches terete, umber-brown, glabrous, covered with minute and inconspicuous lenticels. Leave oval-ovate, slightly oblique, abruptly short-acuminate, cordate or subcordate at the base, sinuate-dentate with minute setaceous-mucronate teeth, thinly chartaceous, 3–9 cm. long, 2–7½ cm. broad, very thinly pilose or glabrate and green above, more or less glaucous and usually thinly subtomentose but thinly pilose along midrib and veins beneath; midrib slender, prominent beneath; veins regularly arranged, 7–10 on each side, erect-patent, gracile, each reaching to the marginal teeth, straight, the lowest ones very slightly arcuate upwards and branching outwards; veinlets delicate, inconspicuous, transversely placed among veins; petiole much shorter than the blade, glabrate. Flower..... Capsule about 4–8, loosely placed and subsessile on slender glabrous rachis 4–5 cm. long, obovato-globose, dark-reddish-brown when dried, about 6–7 mm. across, accompanied by 5 small obtuse or acutish deltoid persistent sepals, usually 10–12-ribbed longitudinally in the calyx-tube, dehiscing transversely through the persistent long filiform divergent styles, with ligenous carpels. Seeds 2, oblong, slightly compressed, smooth, yellow-whitish, 4½ mm. long.

Hab. Prov. KŪ; Mt. Kōya (*Z. Matsuura* and *S. Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, July 19, 1883); Prov. HIDA: Nakahara-mura in Masuda-gōri (*K. Mori!* herb. ibid. Aug. 19, 1886); Prov. MIKAWA: Mt. Gonzore in Higashi-Kamō-gōri (*G. Nagura!* July 4, 1896); Prov. SHENANO: Kiso (*S. Gotō!* Sept. 1899).

This comes between *Corylopsis spicata* Sieb. et Zucc. and *C. pauciflora* Sieb. et Zucc., having a close resemblance to *C. glabrescens* Franch. et Sav., and is found on mountains of the middle Japan. We had not yet a favourable opportunity to see specimens in flower. I have named it in memory of Mr. Suekichi Gotō, Assistant in the Dendrological Institute, Agricultural College, Imperial University of Tokyo, who kindly handed me a specimen collected by himself.

Acer trifidum Hook. et Arn. Bot. Beech. Voy. p. 174: Sieb. et

Zucc. Fl. Jap. Fam. Nat. in Abh. Akad. Muench. IV. 2, p. 157, et Fl. Jap. II. p. 81, tab. 143, excl. fig. I. et figg. 1-4; C. Koch in Ann. Mus. Bot. Lugd.-Batav. I. p. 251; Miq. Prol. Fl. Jap. p. 19, et in Archiv. Néerl. II. p. 470; Franch. et Sav. Enum. Pl. Jap. I. p. 87, II. p. 320; Maxim. in Mél. Biol. X. p. 603; Pax in Engler's Bot. Jahrb. VII. p. 186; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 142, non Thunb.

Acer Buergerianum Miq. Prol. Fl. Jap. p. 20, et in Archiv. Néerl. II. 1867, p. 469; Franch. et Sav. Enum. Pl. Jap. I. p. 88.

Acer palmatum var. *subtrilobum* C. Koch l. c. p. 251, ex Miq.

Acer trinerve Drippel Laubholzkunde II. p. 428, fig. 200; Pax l. c. XVI. p. 393; Makino in Bot. Mag., Tokyo, XIV. p. 136.

Dippel's *A. trinerve*, cited above, is a young state of this species.

In Mélanges Biologiques X. p. 603, Maximowicz says that, seeing upon Thunberg's inedited figure and authentic specimen, *Acer trifidum* Thunb. is *Lindera triloba* Bl., but now judging from Thunberg's original diagnoses in his Flora Japonica p. 163, which I have examined carefully, it must be identified to *Gilibertia japonica* (Jung.) Harms (= *Dendropanax japonica* Seem.), as I do so in the previous page.

Var. integrifolium Makino var. nov.

Branchlet slender, brownish-grey, the young one tomentose. Leaves subrhombic-oblong, shortly acuminate with an obtuse or acutish tip, rounded or obtuse at the base, entire, rarely bifid, chartaceous, glabrous above, subglaucous and more or less tomentose along main nerves beneath, triplicated, with finely reticulated veinlets, 4-7½ cm. long, 2-3½ cm. wide; petiole filiform, glabrous, shorter than the blade. Samaras (immature) densely clustered, corymbose; wings thin, obliquely narrow-oblong, erect-patent.

Hab. Prov. HIZEN: Nagasaki (*I. Murakami!* May 1892).

Rare.

***Acer pictum* Thunb. var. angustilobum** Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 51.

A tall tree. Leaves long-petiolate, 5-cleft, 4-9 cm. long, 5-13 cm. wide, broadly truncate or sometimes truncato-subcordate at the base, chartaceous, glabrous, but tomentose at basal axils of radiating main nerves; lobes lanceolate or ovate-lanceolate, prolonged acuminate, entire and more or less crispate on margins, the lowest lobes horizontally patent; main nerves 5, radiating from the base, slender, straight; veinlets delicate,

reticulated; petiole slender, longer or shorter than the blade. Samaras rather numerous, glabrous; cocci compressed, reticulately nervate, the outer edge rounded; wings erect, oblong-lanceolate, obtuse or acutish at the apex, often partly lying one on another.

Hab. Prov. TOSA: Kitagawa in Nanokawa-mura (*T. Makino!* Nov. 3, 1887).

***Stellaria filicaulis* Makino sp. nov.**

Loosely caespitose, quite glabrous, attaining about $7\frac{1}{2}$ decim. in height. Stems erect or ascending, stout-filiform, elongate, weak, acutely 4-gonous with smooth angles, loosely and dichotomously branching, internodes longer than the leaves. Leaves opposite, spreading or erect-patent, angustate-linear, but sometimes linear in the inferior ones, sessile, acuminate with an obtuse or acutish tip at the apex, gradually attenuated below and clasping the stem, entire, thin, with a gracile midrib and very delicate loose and inconspicuous veins, $1-3\frac{2}{3}$ cm. in length, 1-2 or sometimes 3 mm. in breadth. Flower terminal, solitary, small, 6-9 mm. across; pedicel slender, filiform, $1\frac{1}{2}-6$ cm. or more long. Sepals 5, erect-patent, subulate-lanceolate, acuminate with a very sharp tip, entire, scarious towards margins, quite glabrous, trinerved, about $3\frac{1}{2}-4$ mm. long. Petals 5, erect-patent, white, longer than the sepals, 2-cleft with linear and obtuse-tipped lobes, narrowly cuneate below, about 6-8 mm. long. Stamens 10, shorter than the petals; filament subulate-filiform, glabrous; anther minute, ovate-elliptical. Ovary obovoid-ellipsoid, glabrous; styles 3, free, erect, but slightly divergent above, filiform, glabrous, equalling the stamens in height, with a narrow stigma at the inner side above; ovules many (about 16-17), minute, orbicular or obovato-orbicular, compressed. Capsule surpassing the persistent calyx, oblong-cylindrical, glabrous, about 6 mm. long, with thin carpels, bursting into 6 narrow lobes above. Seeds rather many, reddish-ferruginous, obovate, compressed, minutely rugulose, 1 mm. long, provided with filiform funicles which are unequal in length.

Hab. Prov. MUSASHI: Yōda in Koiwa-mura (*K. Watanabe!* June 16, 1895; *T. Makino!* June 23, 1895); Prov. SHIMOOSA: Mama (*K. Watanabe!* June 16, 1895); Prov. HITACHI: Itako (*Y. Suzuki!* May 19, 1901).

It grows at grassy place in field, and it is more or less allied to *Stellaria longifolia* Muhl.

Rubus pedatus Smith ; Willd. Sp. Pl. II. p. 1088 ; Pers. Syn. Pl. II. p. 52 ; Pursh Fl. Amer. Sept. I. p. 349 ; Hook. Fl. Bor.-Amer. I. p. 181, tab. LXI ; Torr. et Gray, Fl. North Amer. I. p. 452 ; Ledeb. Fl. Ross. II. p. 71 ; Walp. Repert. II. p. 23 ; O. Kuntze Methodik pp. 130, 137-139, 156 ; Focke in Engl. et Prantl, Die Natürl. Pflanzenfam. III. 3, p. 29.

Perennial unarmed herb. Stem filiform, long creeping, nearly glabrous, rarely divided, rooting at nodes. Branches short, erect, 1-3-leaved, thinly pilose. Leaves alternate, laxly placed, erect, long-petioled, trisected, or pedately quinate by the division of the both lateral leaflets, firmly membranaceous, very sparingly pilose, $1\frac{2}{3}$ - $4\frac{1}{2}$ cm. across ; leaflets shortly pedicellate, subrhombic-elliptical, cuneate towards the base in the mid one, incise-serrate with mucronate ovate teeth ; petiole filiform, longer than the blade, thinly pilose ; stipules free, 2 to the base of petioles, ovate to orbicular, ciliated, membranaceous, often concave, persistent. Peduncle filiform, uniflorous, erect from the top of branches, solitary, about equal to leaves in height, thinly pilose and sometimes sparingly intermixed with glandular hairs, mostly 2-bracteate at the middle ; bracts opposite, ovate, membranaceous. Calyx deeply 5-parted ; lobes at length reflexed, narrowly oblong to broadly lanceolate, plane, acute or acuminate, mucronate, entire, ciliated, thin, very sparingly pilose and sometimes moreover with loose glandular hairs, green, nervate longitudinally. Petals 5, about the length of the calyx-lobe, narrowly obovate-oblong, obtuse, sessile, white. Stamens numerous, shorter than the calyx-lobe ; filament filiform, glabrous ; anther minute, broadly rounded. Ovaries 3-4, obovate-oblong, glabrous ; style terminal, filiform, glabrous, 4-times as long as the ovary ; stigma terminal, punctate. Drupels 3-4, accompanied by the persistent calyx, ovate-elliptical, distinct and pulpy in fruit, red in mature, with a persistent style ; stone smooth, coriaceous.

Dalibarda pedata Stephan ; Spreng. Syst. Veg. II. p. 526.

Comaropsis pedata Sér. in DC. Prodr. II. p. 555.

Nom. Jap. *Kogane-ichigo*.

Hab. Prov. SHINANO : Mt. Komagadake (*R. Yatabe* ! herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 2, 1880) ; Prov. SHIMOTSUKE : Mt. Nyohō in Nikkō (*H. Takeda* ! Aug. 18, 1901).

This species has not until now been found in the Flora of Japan, being known only in the western territory of North-America. In general habit, it is as *Duchesnea indica* Focke (*Fragaria indica* Andr.).

Allium fistulosum Linn. β . **viviparum** Makino in Bot. Mag., Tokyo, XII. 1898, p. 340.

Leaves similar to the type. Peduncle viviparous with a few young plants, and floriferous.

Nom. Jap. *Yagura-negi*, *sangai-negi*, *tō-negi*.

Icon. Inuma's Sōmoku-Dzusetsu, VI. fol. 33 recto.

Hab. Japan, cult. and China.

Rumex (Lapathum) **Daiwoo** (Sieb.) Makino nom. nov.

Robust perennial, attaining about $1\frac{2}{3}$ m. in height. Roots thick, yellow. Stem stout, erect, simple, flexuous, striato-sulcate, fistulous, glabrous, but often pubescent under the nodes, often tinged with rose-purple colour. Leaves alternate, ample, petioled, gradually diminishing in size and transferring into bracts, oblong-ovate, but ovate-lanceolate in the above ones, broadly ovate to ovato-oblong in the radical ones, obtuse or acutish, broadly cordate to rounded at the base, irregularly more or less waved and crispate, herbaceous, glabrous above, scabrous-pubescent along veins and veinlets beneath, the largest one attaining about 47 cm. long, 28 cm. broad; the midrib stout, prominent beneath; veins numerous, patulous; veinlets reticulated; petiole shorter than the blade in the cauline leaves, but in the radical leaves very slender and often longer than the blade; ocrea membranaceous, longitudinally nervate, 1-7 cm. long. Panicle loose, formed by the terminal and axillary slender racemes; rachis slender, erect, more or less flexuous, striate, sometimes abbreviated, often puberulent, pubescent below the nodes; verticels densely flowered, about $1-2\frac{1}{2}$ cm. across, usually interruptedly remote one another, but often approximate in the superior ones, the lower verticels bracteate; bract leaf-like, linear to lanceolate, shortly petiolate, obtuse, or acutish, acute at the base, more or less crispate on the margin, $2\frac{1}{2}$ -8 cm. long. Flower small, green, about $4-4\frac{1}{2}$ mm. in diameter; pedicels filiform, horizontally patent and usually slightly arcuate downwards; sometimes coherent below, unequal in length, about 3-8 mm. long. Outer perianth 3, patent, glabrous, herbaceous, connate at the base; lobes oblong, very concave within, rounded-obtuse on the back, obtuse at the apex, entire and subdiaphano-membranaceous on the margin, $1\frac{1}{2}$ -2 mm. long, persistent and then shaded with rose-colour towards the margin and apex. Inner perianth 3, erect-patent, longer than the outer ones, glabrous, herbaceous; lobes broadly oblong, obtuse, membranaceous and more or less minutely crose on the margin, with anastomosing

veins, $2\frac{1}{2}$ –3 mm. long, after anthesis gradually enlarged and tinged with rose-colour, in fruit deltoid-ovate to ovate-reniform, minutely denticulate on the margin, obtuse, subcrispate, reticulated-veined, 4–8 mm. wide, the midrib narrowly prominent below but not calliferous, or sometimes hardly and minutely uncalliferous. Stamens 6, equalling the inner perianth in height; filament linear-filiform, glabrous, white, shorter than the anther; anther oblong-linear, obtuse at the inferior end, obtuse and hardly bifid at the superior end, basifixed, yellow. Ovary minute, included, yellow-viridescent, triquetrous-globose, glabrous, nearly 1 mm. long; styles 3, erect-patent, shorter than the ovary; stigma densely tufted, white; ovule solitary, erect, very minute. Seeds narrowly ovate, triquetrous, tapering above, brown, shining, mainly sterile.

Lapathum Daiwoo Siebold Synops. Pl. Oeconom. Jap. in Verh. Bat. Gen. XII. 1830, p. 19.

Rumex Madaio Makino in Bot. Mag., Tokyo, X. 1896, p. 107.

Rumex aquaticus? β . *japonicus* Meisn. in Ann. Mus. Bot. Lugd.-Bat. II. p. 55; Franch. et Sav. Enum. Pl. Jap. I. p. 392, non II. p. 470.

Hab. Prov. TOSA: Kitagawa in Nanokawa (*K. Watanabe!* June 9, 1888), Nanokawa (*K. Watanabe!* May 18, 1889), Sakawa (*T. Makino!* 1892, June 1893), Ananai, cult. (*T. Makino!* June 2, 1892); Prov. MUSASHI: Tokyo, Bot. Gard. Sc. Coll. Imp. Univ., cult. (*T. Makino!* June 1900); Prov. SHIMOTSUKE: Chūzenzi, etc. in Nikkō (*T. Makino!* July 1900); Prov. SHINANO: Goryō (*R. Yatabe* and *Z. Matsumura!* Herb. Soc. Coll. Imp. Univ. Tokyo, July 19, 1880).

An allied species of *Rumex domesticus* Hartm. and *R. aquaticus* Linn., principally distinguished by its interruptedly remote verticels; sparingly distributed over Japan, commonly growing on sides of mountain rivulets, and sometimes cultivated. The root is sometimes employed as a drug by the rustics.

Rumex domesticus Hartm.; Spreng. Syst. Veg. II. p. 161; Chamiss. et Schlecht. in Linnæa III, p. 56; Chamiss. in Ibidem, VI. p. 591; Peterm. Deutschl. Fl. p. 486; Nyman Syll. Fl. Europ. p. 326; Hook. et Arn. Bot. Beechey's Voy. p. 129; Hook. Fl. Bor.-Amer. II. p. 129; Ledeb. Fl. Alt. II. p. 60; Id. Fl. Ross. III. p. 506; Koch Syn. Fl. Germ. et Herv. ed. 3, p. 531; Sowerby's Eng. Bot. ed. 3, VIII. p. 50, tab. MCCXIX; Fr. Schm. Reis. im Amurl. u. Ins. Sachal. p. 167; Herd. Pl. Radd. in Act. Hort. Petrop. XI. p. 191.

Rumex Hippolapathum a. domesticus Fries.

Rumex crispus β . *domesticus* Weinm.

Rumex longifolius "DC." Meisn. in DC. Prodr. XIV. p. 44.

Rumex alpinus Willd. herb. ex Spreng.

Rumex aquaticus β . *crispatus* Wahlenb.

Rumex aquaticus Hook. ; Benth. Handb. Brit. Bot. ed. 5, p. 380 ; Makino in Bot. Mag., Tokyo, X. p. 108, non Linn.

Rumex aquaticus var. *japonicus* Franch. et Sav. Enum. Pl. Jap. II. p. 470, non Ibidem I. p. 392, et nec Meisn.

Hab. Prov. MUSASHI : Shimura (*T. Makino!* May 22, 1898) ; Prov. RIKUCHŪ : Near Itsukushi (*T. Makino!* Aug. 1890) ; Prov. SHINANO : Mt. Togakushi (*R. Yatabe* and *Z. Matsumura!* Herb. Sc. Coll. Imp. Univ. Tokyo, July 10, 1884) ; Prov. IWASHIRO : Foot of Mt. Bandai (*Z. Matsumura!* Herb. l. c. Aug. 1879), Aidzu (*Z. Matsumura!* Herb. l. c. Aug. 17, 1879) ; Prov. HIDAKA : Saruru (*Y. Tokubuchi!* Herb. l. c. Aug. 12, 1892) Horoidzumi (*Y. Tokubuchi!* Herb. l. c. Aug. 20, 1892).

This species is found in the middle and northern Japan.

Pedicularis (Anodontæ, Sceptra) **nipponica** Makino in Bot. Mag., Tokyo, IX. 1895, p. 72.

Robust perennial, attaining about 10 decim. in height, with a stout and often ramose inflorescence and a stout and short stem. Stem terete, pubescent, leafy. Leaves opposite, placed towards the base of the plant, with a petiole which is dilated at the base, but sessile and clasping the stem in the upper ones, oblong or oblong-lanceolate, acuminate, rather shortly narrowed below, bipinnatifid, broadly winged on both sides of the rachis, glabrous, but pubescent along the rachis in the upper surface, the superior ones smaller in size and connate at the base, the largest one attaining 40 cm. or more in length and about 16 cm. in breadth ; pinnae numerous, patent, alternate, lanceolate, attaining about $3\frac{2}{3}$ cm. wide, acuminate, with numerous deltoid-lanceolate and taperingly pointed lobes which are argutely serrate with simple or serrulate teeth, largest in the middle ones but gradually diminished below and at length into only serrated deltoid lobes ; rachis prominent beneath, the wing irregularly dentate with serrulate teeth ; veins of pinnae numerous, straight or slightly arcuate. Inflorescence over-topping the leaves, loosely ramose, but occasionally simple ; spike elongate, with stout and pubescent rachis ; bracts numerous, alternate and

sessile, but opposite and connate below in the inferior ones, deltoid-ovate, or orbicular-ovate, or elliptical, concave, acute or obtuse, inciso-serrate with serrulate teeth, many or several-veined, with fine and reticulated veinlets between veins, pubescent with glandular and several-cellular hairs, $\frac{2}{3}$ –4 cm. long but the inferior ones often larger and leaf-like with broad and connate bases, persistent. Flowers closely disposed, erect-patent, very shortly pedicellate or nearly sessile, subtended by the bract which much shorter than the flower, 4–5 cm. long, rose-coloured. Calyx campanulate, sometimes tubuloso-campanulate, 9–15 mm. long, sparingly pubescent and ciliate^d with glandular and several-cellular hairs; the tube membranaceous, with 5 nerves each running to the limb-lobes accompanied by usually a weak vein between them, with reticulated and delicate veinlets above; the limb usually 5-lobed, with rounded sinuses between lobes, the lobes about one-thirds as long as the calyx-tube, ovate or ovate-lanceolate, acute, pluriserrate or subinciso-serrate excepting its very base, thicker than the tube. Corolla about $3\frac{1}{2}$ -times as long as the calyx, bilabiate, splitting down to the middle, deciduous; the tube more or less attenuated below, hairy partly below the lower lip internally; the upper lip erect, slightly arcuate inwards and subgaleate, with an obtuse end, pubescent with many-cellular hairs on both front margins; the lower lip ample and equalling the upper lip in length, spreading, 3-lobed, the lobes entire, equalling in size and height, close-placed so that their lateral edges overlap one over another. Stamens 4, sub-didynamous, inserted to the lower portion of the corolla-tube, very slightly lower than the corolla in height and enclosed within its upper lip; filament long, filiform, glabrous excepting the very base which is pubescent; anthers coherent in pair, ovate, with oblong parallel celled and a thickish connective. Ovary oblong-ovate, a little oblique, acute at the apex, shorter than the calyx; style slender, filiform, hamate-arcuate in the apical portion, glabrous; stigma more or less capitellate. Capsule very shortly pedicellate, accompanied by the splitting persistent calyx and bract, ovate, tapering above and suddenly hooked downwards with the basal remainder of the style, slightly compressed, glabrous, about $1\frac{3}{4}$ cm. long; carpels 2, thin and coriaceous. Seeds numerous, with loose and cellular coat.

Hab. Prov. Echigo: Mt. Shimidzu-tōge (*T. Makino!* Sept. 1888).

A very conspicuous species among the Japanese *Pedicularis*; and much more robust than the *Pedicularis gloriosa* Bisset et Moore, which exhibits a close affinity to my species.

Eria reptans (Franch. et Sav.) Makino nom. nov.

Dendrobium reptans Franch. et Sav. Enum. Pl. Jap. II. p. 511.

Eria japonica Maxim. in Mél. Biol. XII. p. 545.

Hab. Prov. TOSA : Mt. Honokawa (*T. Makino!* Aug. 10, 1887); Prov. HYŪGA : Mt. Kirishima (*R. Yatabe* and *Z. Matsumura!* Herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 3, 1882); Prov. KII : Mt. Nachi (*M. Miyoshi!* Herb. l. c. Aug. 18, 1887).

Arisæma (Pedatisecta) **serratum** (Thunb.) Schott, emend.

Forma a. Thunbergii Makino.

Arisæma serratum Schott, 1832; Ejusd. Prodr. Syst. Aroid. 1860, p. 41; Blume in Rumphia I. 1835, p. 107; Kunth. Enum. Pl. III. p. 19; Miq. Prol. Fl. Jap. p. 134, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 96; Franch. et Sav. Enum. Pl. Jap. II. p. 5; N. E. Brown in Journ. Linn. Soc. XVIII. p. 252.

Arum serratum Thunb. in Trans. Linn. Soc. II. p. 338; Ejusd. Ic. Pl. Jap. Decas IV. tab. 7; Pers. Syn. Pl. II. p. 574; Willd. Sp. Pl. IV. p. 479; Spreng. Syst. Veg. III. p. 770.

Arisæma japonicum β . *serratum* Engl. in DC. Monogr. Phanerog. II. p. 549.

Arisæma latisectum Oliv. in herb. Oldham ex Miq. non Bl.

Arisæma angustatum Franch. et Sav. Enum. Pl. Jap. II. pp. 6, 507; Engl. in DC. Monogr. Phanerog. II. p. 566; N. E. Brown in Journ. Linn. Soc. XVIII. p. 251.

Forma b. Blumei Makino.

Arisæma japonicum Blume in Rumphia I. p. 106; Schott Prodr. Syst. Aroid. p. 40; Kunth Enum. Pl. III. p. 19; A. Gray in M. C. Perry's Exped. p. 319; Miq. Prol. Fl. Jap. p. 134, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. pp. 95, 159; Savat. Liv. Kwa-Wi p. 59; Franch. et Sav. Enum. Pl. Jap. II. p. 5; N. E. Brown in Journ. Linn. Soc. XVIII. p. 252; Engl. in DC. Monogr. Phanerog. II. p. 549; Ejusd. in Engler's Bot. Jahrb. VI. p. 52; Ejusd. in Engl. et Prantl Natur. Pflanzenfam. II. 3, p. 151; Ejusd. in Diels Fl. Centr.-Chin. in Engler's Bot. Jahrb. XXIX. p. 236.

Arisæma latisectum Blume in Rumphia I. p. 110; Schott Prodr. Syst. Aroid. p. 55; Kunth Enum. Pl. III. p. 21; A. Gray Bot. Jap. p. 408; Miq. Prol. Fl. Jap. p. 134.

Arisæma japonicum var. *latisecta* Miq. Prol. Fl. Jap. p. 357.

Ariscema japonicum var. *angustifoliolata* Miq. Prol. Fl. Jap. pp. 134, 357, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 95.

Ariscema japonicum var. *latifoliata* Schott ex Miq. Cat. Mus. Bot. Lugd.-Bat. p. 95.

Ariscema amplissimum Blume in Rumphia I. p. 110; Schott Prodr. Syst. Aroid. p. 56; Kunth Enum. Pl. III. p. 21; Miq. Prol. Flor. Japon. pp. 134, 357, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 95; Franch. et Sav. Enum. Pl. Jap. II. p. 6; Engl. in DC. Monogr. Phanerog. II. p. 560.

Arum Dracunculus Thunb. Fl. Jap. p. 233, non Linn.

Nansoo, vulgo *Jamma Konjakf*, it. *Osomi*, Medic. *Ten nan sio* Kämpf. Amœn. Exot. p. 786.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* May 1889, forma a, b), Ishigami-tō in Mt. Torigata (*T. Makino!* May 22, 1889, forma b), Ōmoto in Ogawa-mura (*T. Makino!* Nov. 1891, forma b); Prov. MUSASHI: Chichibu (*R. Yatabe* and *Z. Matsumura!* Herb. Sc. Coll. Imp. Univ. Tokyo April 24, 1878, forma a, b); Nobitome (*T. Makino!* May 13, 1894, forma a, b), Kami-shirane (*T. Makino!* June 6, 1901, forma a), Mt. Mitake (*Z. Matsumura*, *S. Matsuda*, and *Y. Yabe!* Herb. l. c. May 15, 1900, forma a); Prov. SAGAMI: Ubago in Hakone (Herb. l. c. Aug. 24, 1885, forma a, leaf-segments angustato-lanceolate, narrowly acuminate with a very sharp point, irregularly denticulate, thickish in texture, the middle one shortly petiolulate, the rest sessile), Tōnosawa in Hakone (*T. Makino!* April 12, 1901, forma a, b), Mt. Ōyama (*Z. Matsumura* and *S. Matsuda!* Herb. l. c. May 18, 1900, forma a, b); Prov. HITACHI: Mt. Tsukuba (*T. Makino!* April 5, 1894, forma b, May 1897, forma a, b, May 27, 1900, forma a); Prov. AWA (Bōshū): Mt. Kiyosumi (*T. Makino!* April 1896, forma b); Prov. SURUGA: Mt. Fuzi (*R. Yatabe* and *Z. Matsumura!* Herb. l. c. July 25, 1881, forma a; *S. Matsuda!* July 28-31, 1891, forma a); Prov. SHIMOTSUKE: Nikkō (Herb. l. c. Oct. 8, 1878, forma a; *T. Makino!* June 1901, forma a, b), Umagaeshi in Nikkō (*S. Ōkubo!* Herb. l. c. May 17, 1889, forma b), Mt. Kōnosu-yama (*S. Ōkubo!* Herb. l. c. May 21, 1889, forma b), Kobayaku-mura near Nikkō (*S. Ōkubo!* Herb. l. c. May 18, 1889, forma a), Tanzei-yama (*K. Sawada!* Herb. l. c. June 19, 1878, forma b); Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *Z. Matsumura!* Herb. l. c. July 12, 1884, forma b); Prov. KAGA: Yumoto in Mt. Hakusan (*R. Yatabe* and *Z. Matsumura!* Herb. l. c. Aug. 6, 1881, forma b); Isl. Kyūshū [Kiusiu] (Herb. l. c. May 1879, forma b); Prov. YAMATO: Mt. Kasuga (*Z. Matsumura* and *S. Ōkubo!* Herb. l. c. July 13, 15, 1883, forma b); Prov. IDZU: Mt. Ōmuro (*S. Ōkubo!* Herb. l. c.

June 4, 1883, forma a), Sendzu in Isl. Ōshima (*S. Ōkubo!* Herb. l. c. April 17, 1887, forma b), Kashidate-mura in Isl. Miyake (*S. Ōkubo!* Herb. l. c. May 8, 1887, forma b), Ōka-gō in Isl. Hachidyō (*S. Ōkubo!* Herb. l. c. May 1887, forma b); Prov. SŪō: Yamaguchi (*D. Nika!* Herb. l. c. May 14, 1893, forma b); Hokkaidō (*L. Boehmer!* Herb. l. c. forma b); Prov. ISHIKARI: Sapporo (*K. Miyabe!* Herb. l. c. June 1880, forma b).

A common and widely distributed species on hills, mountains and in forests of Japan. The colour and maculation of the petiole and the colour of the spathe are variable. Leaves either entire or serrate or sometimes in the intermediate state; such difference of the leaf-margin is not an important character of this species, and this condition also prevails largely in some other Japanese species of the same genus.

There is a robust species on Mt. Imano in the southern part of Isl. Shikoku. Its fruit is conical; and berries are large and measure $1\frac{1}{3}$ - $1\frac{1}{2}$ cm. or more across, and scarlet when mature; and the rachis is dark-purple. The leaves are entire and pedatisected as those of *Arisæma japonicum* Bl. It may be a new species and I like to give it a new name *Arisæma macrocarpon* mihi.

***Arisæma* (Pedatisecta) *tosaense* Makino sp. nov.**

Corm depressed-globose, densely rooting at the neck. Cataphylls membranaceous, the superior one narrowed above, cylindrically encircled the lower portion of petioles. Leaves 2, but rarely 1, long-petiolate, the inferior one larger, pedatisected; segments 9-19 in the inferior leaf, and 7-13 in the superior leaf, oblong, oblong-lanceolate, or lanceolate, elliptical-lanceolate, or sometimes obovato-oblong, acuminate with a narrowly tapering point, entire or denticulate, membranaceous, the middle one largest, petiolulate, cuneate at the base, that of the inferior leaf 4- $10\frac{1}{2}$ cm. wide, 15-32 cm. long including the petiolule, the rest sessile and gradually decreasing in size outwards; veins delicate, numerous, erect-patent, connecting with an intramarginal vein; petiole erect, vaginate beyond the middle, pallid-green, 20-40 cm. or more long, the free portion about 1-7 cm. long in the superior leaf and 8-12 cm. long in the inferior leaf. Peduncle lower than the leaves, or sometimes equalling or rarely more or less exceeding them, erect, the free superior portion $\frac{1}{2}$ - $10\frac{1}{2}$ cm. or rarely about 17 cm. in length. Spathe erect; the tube convolute and tubuloso-infundibuliform, pallid-green, 5- $6\frac{1}{2}$ cm. long, the mouth abruptly truncate and with recurved margins; the limb fornicately

incurved, ovate, oblong-ovate, or lanceolate-ovate, gradually attenuated above into a long slender tail longer than the tube, 13–32 cm. long, thin, pallid-green. Spadix unisexual, subconico-cylindrical, subsessile, nearly 2 cm. long, many-flowered; the appendage erect, much longer than the spadix, exceeding the mouth of the spathe-tube, shortly stipitate, cylindrical-clavate with a rounded apex, truncate at the base. Male flowers shortly stipitate, 4–6-androus. Female flowers sessile; ovary obovate, with a minute and sessile stigma at the top.

Hab. Prov. TOSA in Isl. Shikoku: Mt. Yokogura (*T. Makino!* June 4, 1887, June 1893); Idzumi at foot of Mt. Torigata (*T. Makino!* May 22, 1889).

This species is found in Isl. Shikoku as quoted above. It is allied to *Arisæma serratum* Schott (incl. *A. japonicum* Bl.), distinguished principally from the latter by the colour of the petiole and spathe, and long caudate spathe-limb. Leaves occur in either entire or denticulate state, as in those of *Arisæma serratum* Schott (including *A. japonicum* Bl.), *A. amurense* Maxim. and *A. Sazensoo* Makino (= *A. sikokianum* Franch. et Sav.).

***Arisæma* (Pedatisecta) *amurense* Maxim.** Prim. Fl. Amur. p. 264; Engl. in DC. Monogr. Phanerog. II. p. 549; Korschins. in Act. Hort. Petrop. XII. p. 392.

Corm depressed-globose, turioniferous; turiones globose, about pea-sized. Cataphylls thinly membranaceous. Leaves tall, 2, or sometimes 1, long-petiolate, radiately pedatisected with 5– (rarely 6–) segments; segments ovate-oval to obovato-lanceolate, acuminate or shortly acuminate, entire (*forma a. integrifolium*), or irregularly serrato-denticulate (*forma b. denticulatum*), the middle one usually slightly larger and shortly petiolulate and cuneate towards the base, the rest sessile and a little confluent at the base, green; veins erect-patent; petiole long-vaginate, pallid-green. Spathe pallid-green, the limb fornicate-incurved, ovato-lanceolate. Spadix unisexual, the floriferous portion about $1\frac{1}{4}$ – $1\frac{1}{2}$ cm. long; appendage erect, shortly stipitate, cylindrical, clavate above, truncate below, a little higher than the spathe-tube. Male flowers 2–4-androus. Berries scarlet, the rachis thick and conical.

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (Herb. ! Sc. Coll. Imp. Univ. Tokyo, Oct. 8, 1879; *T. Makino!* June 1901), Mt. Kōshinzan (*T. Makino!* Sept. 12, 1901); Prov. UZEN: Mt. Yudono (*R. Yatabe* and *S. Ōkubo!* Herb. l. c. July 23, 1887); Prov. ECHIGO: Mt. Godzu (*R. Yatabe* and *S. Ōkubo!* Herb. l. c. Aug. 2, 1886).

This inhabits the middle and northern parts of Japan. The colour of the whole plant, the leaves of 5-segments, and the turioniferous corm, are the principal characters separating this from *Arisæma serratum* Schott and *A. japonicum* Blume.

Arisæma (Pedatisecta) **Sazensoo** (Buerg.) Makino nom. nov.

About 3-6½ decim. in height. Corm depressed-globose. Cataphylls thinly membranaceous, the superior one tubular below, lanceolate above. Leaves 2, the lower one larger, long-petioled, pedatisected with 5-segments, but with 3-segments in the insufficiently grown one, semicircular in the outline; segments ovato-oblong, obovate-oblong, obovato-elliptical, obovato-oval, broadly oval, or broadly ovate, shortly acuminate or cuspidate-acuminate, or sometimes mucronate, cuneate and at length decurrent towards the base, but the outermost one often obtuse at the base, entire (*forma a. integrifolium*), or irregularly or erosely denticulato-serrate or dentate-serrate or coarsely dentate (*forma b. serratum*), often albido-maculate along the midrib in the upper surface; the middle segment usually largest, equal at the base, furnished with a petiolule ½-2 cm. long, or rarely sessile, 2-15½ cm. wide, 6-26 cm. long including the petiolule; lateral segments more or less unequal at bases, the outermost one smallest in size; veins about 8-16 on each side, erect-patent, straight or more or less arcuate and connected with the intramarginal vein; veinlets finely anastomosing, not conspicuous superficially; petiole cylindrically long-vaginate, obliquely or straightly truncate at the mouth, the upper free portion slender, 7-15 cm. long in the superior one and 8-18 cm. long in the inferior one. Peduncle usually lower than leaves, the upper naked portion 2-10 cm. in length. Spathe erect; the tube convolute and tubuloso-infundibuliform, thickly membranaceous, dark-purple, 4-6 cm. long, the mouth truncate and spreading with entire and whitish margins; the limb a little forniculate-incurved and then erect above, longer than the tube, obovato-oblong to oblong-lanceolate, gradually attenuated above and narrowly acuminate; entire, dark-purple externally and whitish internally, thickly membranaceous, longitudinally veined, 10-18 cm. long, 3-5½ cm. broad. Spadix unisexual, subconico-cylindrical, sessile, many-flowered, 1½-3 cm. long; the appendage exceeding the spathe-tube, erect, shortly stipitate, subtruncate at the base, cylindrical below, large and globoso-clavate above and white, 3-6¼ cm. long including the stipe. Male flowers minute, rather laxly disposed, shortly stipitate, 2-4-androus. Female flowers dense-

ly placed, sessile; ovary obovate, 1-celled, with a minute and sessile stigma at the top; ovules 3-4. Fruit conico-oblong, the surface of the rachis darkish purple; berries numerous, roundish-obconical, sessile, scarlet; seeds 1-2 or 3, ovoid, smooth, stipitate; albumen copious; embryo straight, cylindrical.

Arum Sazensoo Buerg. ined. ex Blume in Rumphia I. 1835, p. 107.

Arisæma japonicum β . *Sazensoo* Blume l. c.; Kunth Enum. Pl. III. p. 19; Miq. Prol. Fl. Jap. p. 134, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 95; Franch. et Sav. Enum. Pl. Jap. II. p. 5.

Arisæma amurense γ . *Sazensoo* Engl. in DC. Monogr. Phanerog. II. p. 550.

Arisæma sikokianum Franch. et Sav. l. c. II. pp. 6, 507; Engl. l. c. p. 560; N. E. Brown in Journ. Linn. Soc. XVIII. p. 251; Makino in Bot. Mag., Tokyo, VII. p. 322, cum *var. \beta*. *serratum* Makino.

Nom. Jap. *Yukimochi-sō* (Inuma's Sōmoku-Dzusesu, XIX. tab. 17, three-leaflet form).

Hab. TOSA: Sakawa (*T. Makino!* May 1889, coarsely dentate-leaved form), Shashabu in Chōzya-mura (*T. Makino!* May 23, 1889, entire-leaved form), Kusugami at foot of Mt. Yokogura (*T. Makino!* June 1893, dentate-serrate-leaved form, denticulate-serrate-leaved form, and entire-leaved form); Prov. IYO: Mt. Nakatsumyōzin (*K. Okudaira!* May 13, 1895, entire-leaved form); Prov. HYŪGA: Mt. Kirishima (*R. Yatabe* and *Z. Matsumura!* Herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 4, 1882, dentate-serrate-leaved form).

This species is found in the south-western or the warmer part of Japan, exhibiting an attractive appearance which is principally due to the large, snowy white, and globose-clavate appendage of the spadix. The leaves are commonly pedately divided into 5-segments in the normal state; but 3-segment-leaves are sometimes met with. The condition of the ternately divided leaves are truly not the constantly fixed form, but is always replaced by the proper 5-segment form. Leaves of 5-segments have a close resemblance to those of *Arisæma amurense* Maxim., so that sterile specimens of the two are frequently confused with each other.

Arisæma (Pedatisecta) **heterophyllum** Blume in Rumphia I. p. 110; Schott Prodr. Syst. Aroid. p. 55; Kunth Enum. Pl. III. p. 20; Miq. Prol. Fl. Jap. p. 134, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 95.; N. E. Brown in Journ. Linn. Soc. XVIII. p. 250; Makino in Bot. Mag., Tokyo, XI. 1897, p. 33.

Corm turioniferous; turiones globose, about pea-sized. The middle one of leaf-segments smaller than both lateral ones; petiole green, sparsely nigropunctate (in my living specimen). Inflorescence exceeding the leaves, the spathe green.

Arisæma Thunbergii β . *heterophyllum* Engl. in DC. Monogr. Phanerog. II. p. 546; Diels in Engler's Bot. Jahrb. XXIX. p. 236.

Arisæma Thunbergii Savat. in Inuma's Somoku-Dzusetsu, ed. 2, XIX. tab. 14 (*Maidzuru-sō*), non Blume.

Hab. Prov. MUSASHI: Bot. Gard. Agric. Coll. Imp. Univ. Tokyo in Komaba, cultivated.

I have not found it yet in the wild state in Japan, but probably indigenous.

Arisæma (Trisecta) **ternatipartitum** Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo. VI. 1892, p. 47.

Corm depressed-globose, with fibrous roots at the neck, turioniferous; turiones globose or conical. Cataphylls thinly membranaceous, maculate, loose, obtuse at the apex, the superior one tubular below, the mouth very oblique. Leaves 2, or rarely 1, long-petiolate, trisected with narrow sinuses; segments about equalling in size, sessile, acuminate, minutely scabroserrulate, thin, green above, glaucous beneath, immaculate; the middle segment rhombéo-ovate, cuneate towards the base, 7-16 cm. long, 3-9 cm. broad; lateral segments more or less oblique in form, elliptical-ovate, or ovate, or broadly ovate, $6\frac{1}{2}$ -16 cm. long, $3-9\frac{1}{2}$ cm. wide; midrib prominent beneath; lateral-veins many, erect-patent, connecting by an intramarginal vein which is accompanied by an accessory vein closed to the margin; veinlets copiously anastomosing; petiole cylindrically vaginate below with an oblique mouth above, the free portion slender, about 7-21 cm. long, often longer than the vaginate portion. Peduncle erect, cylindrical, lower than the leaves but often exceeding the leaves in flower. Spathe erect; the tube convolute and cylindrical-tubular, about 5 cm. long, dark-purple, the mouth suddenly truncate with auriculately dilated and revolute margins; the limb deltoid-ovate, or oblong-ovate, acute or more or less shortly acuminate, fornicato-deflected, dark-purple, about 6-8 cm. long. Spadix uni sexual, conico-cylindrical, subsessile, $1\frac{1}{3}$ - $1\frac{2}{3}$ cm. long, many-flowered; appendage shortly (about 8 mm. long) stipitate, exceeding the spathe-mouth, cylindrical-subclavate, thickish and abruptly truncate at the base, $3\frac{1}{2}$ -4 cm. long

exclusive of the stipe. Male flowers loosely disposed, shortly stipellate, 3-4-
androus; anthers purple, with white pollen. Female flowers close-placed,
obovato-globose, with a sessile stigma at the top; ovules 8-15, obconical,
arranged in a circular manner. Fruit oblong-conical; berries numerous,
obovato-globose, scarlet, 6-10 mm. across; seed with a copious albumen and
a straight and cylindrical embryo.

Hab. TOSA: Sakawa, cult. (*T. Makino!* 1885), Nanokawa (*K. Wata-
nabe!* May 6, 1888), Mt. Yokogura (*T. Makino!* May 1892, June 1893),
Hirose in Tosa-gōri (*S. Yano!* April 1891); Prov. IYO: Mt. Shiroe-goe
(*K. Okudaira!* May 2, 1897), Mt. Ishidzuchi (*R. Yatabe!* Herb. Sc. Coll.
Imp. Univ. Tokyo, Aug. 9, 1888).

This is found growing in forests in mountainous districts of south-
western Japan.

***Pinellia tripartita* Schott var. *atropurpurea* Makino.**

The limb of the spathe dark-purple internally.

Hab. Prov. SHIMOTSUKE: Hachiishi in Nikkō, cultivated.

Rare; I have seen only one living specimen cited above. It is figured
in Iwasaki's Honzō-Dzufu, XX. fol. 25 verso-26 recto.

***Pinellia ternata* (Thunb.) Breitenb.** in Bot. Zeit. 1879, p. 687, figs. 1-4.

Arum ternatum Thunb. Fl. Jap. p. 233; Willd. Sp. Pl. IV. p. 481;
Pers. Syn. Pl. II. p. 574; Breitenb. l. c.; Benth. Fl. Hongk. p. 342, in nota.

Ariscema ternatum Schott. 1832; Ejusd. Prodr. Syst. Aroid. p. 60;
Zolling. Syst. Verz. Ind. Archip. I. 1854, p. 76.

Atherurus ternatus Blume in Rumphia I. p. 136; Kunth Enum. Pl.
III. p. 54.

Pinellia tuberosa Tenore, 1830; Schott Prodr. Syst. Aroid. p. 20;
Miq. Prol. Fl. Jap. p. 133, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 95;
Franch. et Sav. Enum. Pl. Jap. II. p. 3; Smith Contr. Mater. Med. et
Nat. Hist. Chin. pp. 149, 172; Hanb. Sc. Pap. p. 262; Bretschn. Bot. Sinic.
in Journ. Chin. Branch. Roy. Asiat. Soc., N. Ser. XXV. p. 239; Engl. in
DC. Monogr. Phanerog. II. p. 566; Ejusd. in Engler's Bot. Jahrb. VI. p. 52;
Ejusd. in Engl. et Prantl Die Natürl. Pflanzenfam. II. 3, p. 151; Ejusd.
in Diels Fl. Centr.-Chin. in Engler's Bot. Jahrb. XXIX. p. 236; N. E.

Brown in Journ. Linn. Soc. XVIII. p. 246; Franch. Pl. David. p. 313 (*var. subpandurata*).

Arum bulbosum Pers. ex Blume l. c.

Arum atrorubens Spreng. Syst. Veg. III. p. 769, ex parte, nec Ait.

Arum fornicatum Roth.

Hemicarpurus fornicatus Nees; Ejusd. in Linnæa XIV. Lit.-ber. p. 167.

Arum subulatum Desf.

Arisæma macrourum Bunge Enum. Pl. Chin. Bor. p. 67.

Typhonium? tuberculigerum Schott in Ann. Mus. Bot. Lugd.-Bat. I. p. 123; Miq. Prol. Fl. Jap. p. 134, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 96; Franch. et Sav. l. c. p. 7.

Arum triphyllum Houtt. Natuur. Hist. XXIX. p. 183, ex parte, nec Linn.

Arum triphyllum Lour. Fl. Cochinch. ed. Willd. p. 652, non Linn.

Arisæma Loureiri Blume l. c. p. 108.

Hab. Prov. MUSASHI: Nobitome (*T. Makino!* May 13, 1894, the leaves are passed into *forma angustata*), Tokyo (*Z. Matsumura*; Herb. Sc. Coll. Imp. Univ. Tokyo, May 1878), Id. Bot. Gard. Koishikawa (*S. Ōkubo!* Herb. l. c. May 23, 1883, *forma angustata*), Kami-Itabashi (Herb. l. c. May 11, 1879); Prov. IDZU: Yugashima (*S. Ōkubo!* Herb. l. c. June 4, 1883); Prov. UZEN: Near Hondōzi-mura (*R. Yatabe* and *S. Ōkubo!* Herb. l. c. July 20, 1887); Prov. IWASHIRO: Moniwa (*T. Makino!* Aug. 1890, the leaves are run into *forma angustata*); Prov. Suō: Ōchi-mura (*D. Nikai!* Herb. l. c. May 26, 1892); Loochoo: Isl. Okinawa (*Y. Tashiro!* Herb. l. c. April 1887).

Not uncommon to find the leaves transformed to those of the **forma angustata** (= *Pinellia angustata* Schott in Ann. Mus. Bot. Lugd.-Bat. I. p. 123; Miq. Prol. Fl. Jap. p. 133, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 95; Franch. et Sav. Enum. Pl. Jap. II. p. 3. = *Pinellia tuberifera* β . *angustata* Engl. in DC. Monogr. Phanerog. II. p. 567; N. E. Brown in Journ. Linn. Soc. XVIII. p. 246).

Vaccinium (Euvaccinium) **Yatabei** Makino sp. nov.

Pygmæous shrub, about 12 cm. in height, divaricately ramose; the subterranean innovations filiform, glabrous, provided with minute scaly leaves. Branches gracile, quadrangular, curved, glabrous but thinly puberulent on faces in young one, 1-1½ mm. across. Leaves alternate, approximately disposed towards the end of branches, scarcely petiolate, ovate or orbicular-ovate, minutely mucronato-acute, rounded at the base, setosely

serrulate with minute and incumbent teeth, membranaceous, hispidulous along the nerves, 4-18 mm. long, 4-14 mm. wide, deciduous; lateral veins about 4 to 6, erect-patent, connecting above; veinlets reticulated, with one or a few simple or branched free venules within areoles. Flower..... Berry shortly pedicellate, globose, truncate and surrounded with a circular calyx-limb at the top, glabrous, scarlet, about 7 mm. across. Seeds small, many, obovate, trigonous, about $1\frac{1}{2}$ mm. long, very minutely and finely striate longitudinally, orange-coloured.

Hab. Prov. SHIMOTSUKE: Nikkō (*R. Yatabe!* July 1877).

Phytolacca (Euphytolacca) **japonica** Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. 1892, p. 49.

Habit of *P. acinosa* Roxb. var. *Kæmpferi* (A. Gray) Makino, but berries depressed-globose, composed of entirely confluent 7-10 carpels, about 8 mm. across, shining, with persistent styles at the top and deeply concave in centre, black and filled with purple juice when matured.

Hab. Prov. TOSA: Nanokawa (*K. Watanabe!* May 30, 1886); Mt. Imano (*T. Makino!* Aug. 7, 1889), Kusugami (*T. Makino!* June 1893); Prov. MUSASHI: Chichibu (*T. Makino!* July 18, 1888); Prov. SHIMOTSUKE: Nikkō, cult. (*T. Makino!* Sept. 1901), Mikouchi near Ashio, cult. (*T. Makino!* Sept. 1901).

An allied species of *Phytolacca acinosa* Roxb. var. *Kæmpferi* (A. Gray) Makino, which is common in Japan, but the berries are very different, and its rachis of raceme is often purple in fruit. It is often cultivated, and the leaves are used as a vegetable, as also

Phytolacca acinosa Roxb. β . **Kæmpferi** (A. Gray) Makino, nom. nov. = *Phytolacca Kæmpferi* A. Gray Bot. Jap. 1859, p. 404; Miq. Prol. Fl. Jap. pp. 125, 301. = *P. acinosa* β . *esculenta* Maxim. in Ind. Sem. Hort. Petrop. 1869, Suppl., p. 23; Franch. et Sav. Enum. Pl. Jap. I. p. 385. = *P. octandra* Thunb. Fl. Jap. p. 189; Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abhandl. Akad. Muench. IV. 2, p. 166; Hoffm. et Schult. Noms indig. Pl. Jap. 1853, Paris, p. 60, non Linn. = *Sjooriku*, vulgo *Jamma Góbó* Kæmpf. Amœn. Exot. 1712, p. 828, cum icone.

Cotyledon (Umbilicus, Orostachys) **Iwarenge** Makino sp. nov.

Stem short, erect, or ascending, leafy, without stolon, 15-28 cm. in height

including the raceme, usually ramose above, but rarely simple and one-racemiferous; branches one to several, axillary, ascending and racemiferous. Leaves succulent, oblong-spathulate, or lanceolate-spathulate, plane, manifestly obtuse at the apex, quite caesious-glaucous; cauline ones sparse, approximate, patent or reflexed; radical ones imbricately rosulate before anthesis, mostly ever-green throughout the winter. Rosettes 5–10 cm. across. Raceme erect, densely flowered, cylindrical; bracts ovate, acute or acutish, lower than the flower, quite green. Flowers pedicellate, bi-bracteolate, the inferior ones often long-pedicellate and several-bracteolate; the bracteole linear-lanceolate, or oblanceolate, tapering above. Sepals subulate-lanceolate, tapering above, viridescant. Petals patent, angustato-oblanceolate, acute, twice as long as sepals, white. Stamens a little longer than the corolla; filament filiform; anther yellow. Hypogynous scales minute, rectangular-spathulate, truncate at the top. Ovaries upon a very slightly elevated receptacle, erect, oblong-ovate, narrowed below, gradually attenuated into a short style above; ovules many, minute, cylindrical. Follicles erect, ovato-oblong, attenuated at both ends, often rose-coloured. Seeds cylindrical-oblong, slightly enlarged above.

Umbilicus malacophyllus vel *U. stamineus* Miq. Prol. Fl. Jap. p. 89, non DC. et Ledeb.

Cotyledon malacophylla Franch. et Sav. Enum. Pl. Jap. I. p. 159. non Pall.

Cotyledon malacophylla var. *japonica* Franch. et Sav. l. c. II. p. 365.

Sinqua, vulgo *Ikingusa* et *Iwarenge* Kämpf. Amœn. Exot. p. 912.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cultivated (Herb.! Sc. Coll. Imp. Univ. Tokyo, Oct. 15, 1880, Nov. 1888; *T. Makino!* Nov. 1893); Prov. SAGAMI: Itabashi near Odawara (*T. Makino!* Nov. 1901).

The leaves are manifestly obtuse and quite caesious-glaucous without admixture of other colour. The radical rosulate leaves mostly remain without perishing during winter. From above-mentioned characters, this species differs apparently from *Cotyledon malacophylla* Pall. The colour of leaves, which give a peculiar appearance to this plant, is not recognizable upon dried specimens, therefore this and *C. malacophylla* Pall., were frequently confounded.

Cotyledon (*Umbilicus*, *Orostachys*) **malacophylla** Pall.; Willd. Sp. Pl. II. p. 756; Pers. Syn. Pl. I. p. 510; Spreng. Syst. Veg. II. p. 438; Maxim. in Mém. Biol. XI. p. 723; Korschins. in Act. Hort. Petrop. XII. p.

340; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 282; Palib. Consp. Fl. Koreæ p. 93.

Stem erect, short, simple, leafy, one-racemiferous at the top, 5–20 cm. or more in height including the raceme. Leaves succulent, oblong to narrowly oblong-spathulate, plane, acute at the apex, green, not cæsious or not glaucous; cauline ones sparse, spreading or erect-patent; radical ones rosulate before anthesis, withering in winter, leaving a closely imbricated young-leaved globose bud in centre. Rosettes about 4–7 cm. across. Offsets a few to many, lastly free. Raceme erect, densely or rather laxly flowered, cylindrical; bracts ovate, oblong-ovate, or oblong-spathulate, shortly acuminate-acute, longer or slightly shorter than flowers, green. Flowers shortly pedicellate, but nearly sessile above, bi-bracteolate; bracteoles subulate-lanceolate, virescent. Sepals lanceolate or subulato-lanceolate, acuminate, virescent. Corolla campanulate or erect-patent, $1\frac{1}{3}$ or $1\frac{1}{2}$ as long as sepals; petals oblanceolate, or angustato-oblanceolate, acute, white. Stamens exserted; filament filiform; anther purplish, with yellow pollen. Hypogynous scales minute, rectangular-spathulate, truncate at the top. Ovaries sessile, erect, oblong-ovate, narrowed below, gradually attenuated above to a gracile style, often rose-coloured after anthesis; ovules minute, many, cylindrical.

Umbilicus malacophyllus DC. Prodr. III. p. 400; Bunge Enum. Pl. Chin. Bor. p. 104, n. 181; Bot. Mag. tab. 4093; Ledeb. Fl. Ross. II. p. 174; Maxim. Prim. Fl. Amur. p. 114, et Ind. Fl. Pekin. in Ibid. p. 472, et Ind. Fl. Mongol. in Ibid. p. 482; Regel Tent. Fl. Ussur. p. 68, n. 198; Fr. Schmidt Reis. im Amurl. u. Ins. Sachal. p. 131, n. 163

Orostachys malacophylla Fisch.

Sedum malacophyllum Franch. Pl. David. I. p. 129.

Umbilicus stamineus Ledeb. l. c.

Hab. Prov. SHIRIBESHI in Hokkaidō (Ezo): Okushiri (*K. Miyabe* and *Y. Tokubuchi*! Herb. Sc. Coll. Imp. Univ. Tokyo, July 31, 1890); Prov. RIKUZEN: Sendai, cult. from Daitōgasaki in Shōbuda (*A. Yasuda*! Nov. 16, 1900); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb.! l. c. Oct. 1888; *T. Makino*! Oct. 1893).

This is littoral species of northern Japan. The Japanese plant is smaller in all parts than the type, and usually not tinged with purple colour towards the margin of the leaves and bracts. The radical rosulate leaves perish in winter, leaving a young central bud as mentioned above. My thanks are due to Mr. K. Kōriba, who has kindly sent me the living specimens, which were collected from a rocky promontory in Shōbuda (where they are wild) in the province of Rikuzen.

Sedum Sieboldi Sweet **var. erectum** Makino nov. var.

Stem erect, simple; internodes short, much shorter than the leaves. Leaves 3-nate, approximate, patent, obovato-orbicular, broadly cuneate towards the base, entire-margined, not crenate. Flowers as in the type.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb. ! Sc. Coll. Imp. Univ. Tokyo, Oct. 22, 1879; *T. Makino* ! 1890).

Peperomia (Micropiper) **japonica** Makino sp. nov.

Succulent perennial, quite green, attaining 10-33 cm. in height. Roots fibrous, emitting from the base of stems, darkish. Stems tufted, erect, succulent, terete, not angulate, jointed at nodes, loosely ramose above with 1, 2, or verticillate branches, or sometimes simple, subtilely pubescent with minute short soft and erect hairs, light green, attaining 9 mm. across, remaining during 3 years and then decaying; internodes longer or shorter than leaves; branches erect-patent or patulous, terete, simple, jointed to the stem. Leaves 3-6 or sometimes 9-verticillate, patent, petiolate, ovate, subrhombico-obovate, or subrhombico-obovate-elliptical, rounded-obtuse at apex, obtuse or cuneato-obtuse at the base, entire, succulent, but membranaceous and very minutely glittering nigro-punctate under lens in dried state, plane on both surfaces, shining and subtilely pubescent and ciliated with very minute and erect hairs, green above, paler beneath, $\frac{4}{5}$ - $1\frac{1}{5}$ cm. long, $\frac{1}{2}$ - $3\frac{1}{2}$ cm. broad, 5-nerved, but both outermost ones very weak, the nerves hardly visible superficially; petiole shorter than the blade, subterete, more or less flat in front, subtilely pubescent, 2-18 mm. long. Spikes erect or ascending, simple, terminal and axillary, unequal in length, shortly pedunculate, 3-11 cm. long, $1\frac{1}{2}$ - $2\frac{1}{3}$ mm. across; rachis fleshy, slenderly terete, glabrous, but subtilely pubescent in the peduncle, light green, minutely nigro-punctate under lens when dried, slightly foveolate in the inserted place of flowers. Flowers minute, achlamydeous, numerous, sparsely disposed, sessile. Bract-scales minute, closely placed under each flower, thick, peltate, oval at the face, glabrous, light green, minutely nigro-punctate under lens when dried, persistent. Stamens 2, hypogynous, lateral, patent; filament filiform-cylindrical, longer than the anther, white; anther oval, dorsifixed, extrorse, 2-celled, with white pollen. Ovary 1, ascending, obovoid-globose, sessile, glabrous; stigma terminal, sessile, pauci-penicillate; ovule solitary. Berries nearly dried, minute, obovoid-globose, minutely granulato-papillose or granulato-punctate, lesser than 1 mm. in length, accompanied by the bract-scale

below. Seed solitary, globose; albumen copious, white and farinaceous. Fl. May-June.

Peperomia portulacoides Makino in Bot. Mag., Tokyo, I. p. 189, tab. 21; Id. Illustr. Fl. Jap. I. n. 2, p. 2, tab. 10, 11, non A. Dietr.

Hab. LOOCHOO (Coll. Imp. Mus. 1876, herb. *T. Makino*; *H. Kuroiwa*! herb. *T. Makino*), Nakizin in Isl. Okinawa (*S. Tashiro*! herb. Sc. Coll. Imp. Univ. Tokyo, March 1887); Prov. TOSA in Isl. Shikoku: Isl. Heshima (*K. Naganuma*! 1886; *T. Makino*! June 17, 1887; *Y. Yoshinaga*! herb. *T. Makino*); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. from Amami-Ōshima, coll. *T. Uchiyama* (*T. Makino*! Nov. 1901).

This grows on shady littoral rocks of southern Japan, extending between Loochoo Islands southwards, and Isl. Heshima of prov. Tosa in Shikoku northwards. The Heshima plant was at first discovered by myself. The leaves and stem are quite green without any other colour. It comes near to *Peperomia dindygulensis* Miq. Syst. Piper. p. 122; but the leaves to a node are more numerous than in the latter. The Loochoo plant which Forbes and Hemsley (in Lourn. Linn. Soc. XXVI. p. 366) referred to *P. dindygulensis* Miq., probably belongs to my species.

***Peperomia* (Micropiper) *boninsimensis* Makino sp. nov.**

Stem tufted, succulent, slender, declining at base and then ascending, 7-50 cm. long, simple or laxly ramose, terete, smooth, glabrous, lightgreen and often minutely purpureo-punctate, attaining 5 mm. across in dried specimen; internodes $\frac{3}{2}$ - $4\frac{1}{2}$ cm. long. Leaves opposite, or 3-nate, but alternate in the young one, patent, petioled, ovate to ovato-oblong, or obovato-oblong, obtuse and often minutely submarginate, obtuse or acute at base, succulent, but membranaceous and very minutely dark-brown punctate under lens when dried, glabrous excepting the pubescent and ciliated upper margin, green and often purpureo-maculate above, paler beneath, subtily quinque-nerved, both outermost nerves much weak, 1-3 cm. long, $\frac{3}{4}$ - $1\frac{3}{4}$ cm. wide; petiole semiterete, glabrous, 3-13 mm. long. Spike terminal and axillary at the top of stem, erect or ascending, simple, longer than leaves, attaining about 7 cm. in length, glabrous, shortly pedunculate; rachis slenderly terete, a little foveolate in the seated place of flowers, about 2 mm. across, green, very minutely dark-punctate under lens when dried. Flower loosely disposed, minute, numerous, sessile. Bract-scale minute, orbicular or obovate-orbicular, peltate, shortly pedicellate, glabrous, persistent, light green,

very minutely dark-punctate under lens when dried. Stamens 2, lateral, shorter than the ovary; filament short, filiform; anther broadly rounded. Ovary minute, obovoid-globose, green, granulato-punctate; stigma sessile, penicillate. Berries ovoid-globose, papillose-punctate, minutely nigro-punctate under lens when dried, lesser than 1 mm. across; albumen white, farinaceous.

Hab. OGASAWARA-ZIMA [=MUNIN=BONIN ISLANDS] (Herb.! *Yoshio Tanaka*; Herb.! Sc. Coll. Imp. Univ. Tokyo, Sept. 4, 1881), Isl. Chichizima (*S. Ikeno*! Herb. Agric. Coll. Imp. Univ. Tokyo, July 17, 1899).

It seems to come near to *Peperomia portulacoides* A. Dietr.

Actinidia callosa Lindl. Nat. Syst. Bot. ed. 2, 1836, p. 439; Walp. Ann. Bot. Syst. I. p. 15; Benth. in Journ. Linn. Soc. V. p. 55, excl. syn. *A. Kolomikta* Maxim.; Dyer in Hook. fil. Fl. Brit. Ind. I. p. 286, excl. syn. *A. Kolomikta* Maxim.; Maxim. in Mém. Biol. XII. p. 423; Id. in Act. Hort. Petrop. XI. p. 35; Gilg in Engl. et Prantl Die Nat. Pflanzenfam. III. 6, p. 125; Diels in Engl. Bot. Jahrb. XXIX. p. 470.

var. rufa (Sieb. et Zucc.) Makino.

A strong voluble, rufo-tomentose in young shoot. Leaves long petiolate, ovate, oval, elliptical-ovate, obovato-elliptical, oblong, or subsquare-elliptical, abruptly acuminate at apex, but acuminate in those of shoot, rounded, rounded-obtuse, truncate, or sometimes subcordate at base, serrate or crenato-serrate with mucronato-acuminate or setose-mucronate teeth, green shining and glabrous above, usually more or less glaucous and usually rufo-tomentose along the nerves and then glabrate beneath, coriaceous-chartaceous; lateral veins 7-8 on each side. Cyme axillary, shorter than the petiole, pauci-floriferous in those of hermaphrodite flower; peduncle and pedicels rufo-tomentose but glabrate in fruit; bracts usually scaly, or linear. Hermaphrodite flower about 22 mm. in diameter. Calyx rufo-tomentose; sepals oblong, persistent. Petals patent, obovato-elliptical, cuneate towards the base, white, rose-coloured below. Stamens numerous, shorter than the corolla; filament filiform, white, but rose below. Ovary ovoid-globose, light yellow, tomentose; styles numerous, radiant-tufted, crowned on and longer than the ovary. Berry ovoid-oval, brown, verrucoso-punctate, attaining about 3 cm. long, $2\frac{1}{2}$ cm. across, accompanied by reflexed persistent calyx below. Fl. June.

Trochostigma rufa Sieb. et Zucc. in Abhandl. Akad. Muench. III., p. 727, et IV. 2, p. 164; A. Gray Bot. Jap. p. 383; Walp. Repert. V. p. 131.

Actinidia rufa Planch.; Miq. Prol. Fl. Jap. p. 203; Franch. et Sav. Enum. Pl. Jap. I. p. 58; Gilg l. c.

Actinidia arguta var. ? *rufa* Maxim. in Mém. Biol. XII. p. 424; Palib Consp. Fl. Kor. p. 45.

Actinidia callosa Forbes et Hemsl. in Journ. Journ. Soc. XXIII. p. 78; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 20; Ito et Matsum. Tent. Fl. Lutch. I. p. 13, excl. syn. nonnul, non Lindl.

Prov. Tosa : Sakawa (*T. Makino!* 1885, 1892. June 3, 1893), Ōtsuru-tsu (*T. Makino!* Oct. 20, 1885), Ōhira (*T. Makino!* Nov. 1892), Tochinoki in Aki-gōri (*T. Makino!* June 4, 1892); Prov. Suō : Kasa-yama in Koshigahama (*D. Nikai!* Herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 11, 1893); LOOCHOO : Mt. Unna-dake in Isl. Okinawa (*S. Tashiro!* Herb. l. c. May 1887), Kunchan in Isl. Okinawa (*Z. Matsumura!* Herb. l. c. 1897), Isl. Ishigaki in Yaeyama Archip. (*S. Tanaka!* Herb. l. c. June 26, 1891).

This is very closely allied to *Actinidia callosa* var. *arguta* (Sieb. et Zucc.) Makino; but it is apparently distinct from *A. polygama* Miq. and *A. Kolomikta* Maxim. It is found in places near and not too far from sea in southern Japan, while var. *arguta* is widely distributed throughout Japan and common in mountain districts, extending to Isl. Sachalin beyond Hokkaidō (Ezo) northwards. The berry with green pulp is mucilaginous, and it is edible like that of var. *arguta*, and there is the native name *Nashi-kadzura*, meaning Pear-Climber.

var. arguta (Sieb. et Zucc.) Makino.

Trochostigma arguta Sieb. et Zucc. in Abhandl. Akad. Muench. III p. 727, et IV. 2, p. 164; Walp. Repert. V. p. 131; Benth. in Journ. Linn. Soc. V. p. 55.

Actinidia arguta Planch. ex Miq. Prol. Fl. Jap. p. 203; Franch. et Sav. Enum. Pl. Jap. I. p. 58; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 118; Maxim. in Mém. Biol. XII. p. 423; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 78; Hook. fil. in Curtis's Bot. Mag. sub tab. 7497; Gilg in Engl. et Prantl Die Nat. Pflanzenfam. III. 6, p. 125, fig. 66 A.

Actinidia cordifolia Miq. l. c.; Franch. et Sav. l. c.

Actinidia volubilis K. Ito et H. Kaku, Ic. et Descr. Pl. Hort. Koishikawa, II. p. 22, tab. 23, non Planch.

Hab. Prov. Tosa : Sakawa (*T. Makino!* 1884, 1885, May 26, 1889), Nanokawa (*T. Makino!* June 1885), Oku-nanokawa (*K. Watanabe!* June 3, 1889), Akinokawa (*T. Makino!* June 3, 1892), Sōdayama-mura (*T. Makino!* Nov. 1892); Prov. IYO : Kurokawa in Senzoku-mura (*K. Okudaira!* June 25, 1897); Prov. BUZEN : Mt. Iwaga-dake (*R. Yatabe* and *Z. Matsumura!* Herb. Sc. Coll. Imp. Univ. Tokyo, July 17, 1882); Prov.

SUŌ: Ōuchi-mura (*D. Nikai!* Herb. l. c. May 28, 1892); Prov. IDZU: Yoshihama (*S. Ōkubo!* Herb. l. c. June 2, 1883), Mt. Amagi (*S. Ōkubo!* Herb. l. c. June 9, 1883); Prov. SAGAMI: Hakone (*Herb.!* l. c. Aug. 28, 1880, Aug. 16, 1883), Mt. Ōyama (*S. Matsuda!* Herb. l. c. May 17, 1900); Prov. KAGA: Mt. Haku-san (*R. Yatabe* and *Z. Matsumura!* Herb. l. c. Aug. 6, 1881); Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *Z. Matsumura!* Herb. l. c. July 10, 1884); Prov. SHIMOTSUKE: Nikkō (*Herb.!* l. c.; *T. Makino!* June 30, 1900); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*Herb.!* l. c. May 30, 1879, May 29, 1880; *T. Makino!*); HOKKAIDŌ (*L. Boehmer!* Herb. l. c.); Prov. ISHIKARI: Sapporo (*R. Yatabe!* Herb. l. c. July 30, 1878, Aug. 1878; *Y. Tokubuchi!* Herb. l. c. Sept. 8, 1892).

A large and tall climber, the main stem attaining 20 cm. or more in diameter with age.

Shortia rotundifolia (Maxim.) Makino in Bot. Mag., Tokyo, IX. p. 327, X. p. 221, et XII. p. 230.

Rhizome elongate, erect or ascending, about 4–10 cm. long, woody, rooting below. Leaves tufted on the summit of the rhizome, long petioled, orbicular or ovato-orbicular, truncato-retuse at the apex with a slight-depression in centre, rounded and shortly decurrent to the petiole at the base, apiculate sinuato-dentate, chartaceo-membranaceous, glabrous; midrib and veins slender, elevated above, the veins 3–5 on each side; petiole slender, longer than the blade, attaining about 8 cm. in length. Scape erect, slender, uniflorous, attaining about 12½ cm. in height, glabrous, remotely about 4–5-bracteate, furnished with a few membranaceous subulate acuminate scales at the base; bract erect, subulate-lanceolate, tapering above, entire, membranaceous, 6–6½ long, the uppermost one approximate to the calyx. Sepals 5, slightly unequal in length and width, imbricated, erect-patent, deltoid-ovate and acutish or obtuse in the outer one, but oblong and emarginate in the inner ones, entire, but minutely suberose at apex in the inner ones, membranaceous, glabrous, 7–8 mm. long in fruit, longitudinally 9–10-nerved, the midrib slightly prominent externally. Corolla..... Stamen..... Capsule globose, with a persistent style, glabrous, 4½ mm. long, dehiscing into 3 thinly coriaceous carpels; placentas thick, central. Seeds minute, numerous, ferruginous, obovato-cylindrical, lesser than 1 mm. in length; testa very minutely reticulated.

Schizocodon rotundifolius Maxim. in Mém. Biol. XII. p. 743; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 34.

Hab. YAEYAMA ARCHIP. (*S. Tashiro!* Herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1887).

Schizocodon soldanelloides Sieb. et Zucc.

a. genuinus Makino in Bot. Mag., Tokyo, XII. 1898, p. 229.

Rhizome short or long. Leaves usually loosely tufted; blade $1\frac{1}{3}$ –11 cm. long, $1\frac{1}{2}$ –11 cm. broad, multidentate, cordate or rounded at base; nerves often impressed above. Raceme several-many-flowered.

Schizocodon soldanelloides Sieb. et Zucc. in Abhandl. Akad. Münch. III. p. 725, tab. 2, fig. 1; Miq. Prol. Flor. Jap. p. 258; Maxim. in Mél. Biol. VI. p. 273, et VIII. p. 20; Franch. et Sav. Enum. Pl. Jap. I. p. 298; Gard. Chron. 3rd Ser. XIII. 1893, p. 415, fig. 59; Bot. Mag. tab. 7316; Drude in Engl. et Prantl Die Nat. Pflanzenfam. IV. 1, p. 83, fig. 50.

Soldanella crenata Sieb. herb. ex Miq. l. c.

Soldanella sinuata Sieb. herb. ex Miq. l. c.

Hab. Widely distributed over Japan.

forma alpina Maxim. in Mél. Biol. VIII. p. 20; Makino l. c.

Leaves small; serrations obsolete. Scape short, few-flowered.

Icon. Inuma's Sōmoku-Dzusetsu IV. fol. 7 recto.

This form is frequently passed into the typical one.

β. ilicifolius (Maxim.) Makino l. c.

Rhizome long and slender, branched. Leaves often denser, usually accompanied by died ones below; blade ovate, rounded-ovate, or elliptical, paucidentate, obtuse or rounded or truncaty-cordate at base, $\frac{1}{2}$ –5 cm. long, $\frac{1}{3}$ – $4\frac{1}{2}$ cm. broad; nerves impressed above. Raceme 1–5-flowered; corolla white (*forma albiflora*) or purple (*forma purpureiflora*).

Schizocodon ilicifolius Maxim. in Mél. Biol. VI. p. 273, et VIII. p. 21; Franch. et Sav. Enum. Pl. Jap. I. p. 298; Drude l. c. p. 83.

Hab. Prov. MUSASHI: Mt. Yōkami in Chichibu (*T. Makino!* July 1888), Mt. Mitake (*Z. Matsumura, S. Matsuda, and Y. Yabe!* Herb. Sc. Coll. Imp. Univ. Tokyo, May 15, 1900); Prov. SHIMOTSUKE: Mt. Kōshinzan (*T. Makino!* Sept. 1901); Prov. UZEN: Mt. Gassan (*R. Yatabe and S. Ōkubo!* Herb. l. c. July 23, 1887); Prov. SAGAMI: Mt. Futago in Hakone (*S. Ōkubo!* Herb. l. c. Aug. 27, 1883), Mt. Komagadake in Hakone (*S. Ōkubo!* Herb. l. c. Aug. 24, 1884).

This variety is sometimes hardly distinguishable from the typical one.

Polygonatum Periballanthus (Franch. et Sav.) Makino in Bot. Mag., Tokyo, XII. 1898, p. 228.

Periballanthus involucratus Franch. et Sav. Enum. Pl. Jap. II. p. 524.

Polygonatum involcratum Maxim. in Mém. Biol. XI. p. 844.

Hab. Prov. MUSASHI: Shibuya (*T. Makino!* Apr. 27, 1891), Tokyo, Bot. Gard. Koishikawa, cult. (Herb. ! Sc. Coll. Imp. Univ. Tokyo, May 23, 1881, April 30, 1883); Prov. TOSA: Sakawa, cult. (*T. Makino!* May, 25 1887, May 17, 1892).

Var. ibukiense Makino l. c. p. 229.

Involucral-bracts 4, small. Flower small, 2–4-fasciculate within the involucral-bracts.

Icon. Inuma's Sōmoku-Dzusetsu VI. fol. 5 recto.

Dioscorea Tokoro Makino in Bot. Mag., Tokyo, III. 1889, p. 112; Id. Illustr. Fl. Jap. I. n. 4, 1889, p. 1, tab. XXIV. et n. 7, 1891, p. 4.

Rhizome subterranean, repent, solid, thick, branching, rooting. Stem voluble, sinistrorse, terete, often slightly striate. Leaves alternate, petiolate, rounded-ovate, reniform-ovate, or often ovate in the superior ones, subauriculato-cordate at the base with a deep or widely opened sinus and rounded lobes, rather abruptly acuminate with a very tapering point, entire or very scarcely lobate-waved, firmly herbaceous, but membranaceous when dried, glabrous, green and shining above, paler beneath, $4\frac{1}{2}$ –19 cm. long, 3–16 cm. broad; main-nerve 7–9, radiating from the base, prominent beneath, the lateral ones curved, the outermost one with a branch outwards; transverse veinlets numerous; petiole slender, shorter than the blade, glabrous, shallowly canaliculate in front, slightly enlarged and purple at both ends. ♂: Raceme angustate, ascending, but then often pendulous by its weight, attaining about 50 cm. in length, solitary to a few in the leaf-axils, simple or divaricately few-branched, or sometimes paniculate; rachis slender, triquetrous, glabrous, green; bract minute, subulate, very sharply tapering, shorter than the pedicel; bracteoles smaller than the bract, subulate. Flower 4 – $4\frac{1}{2}$ mm. across, pedicellate, 2–many-fasciculate in subscorpioid manner with an extremely short peduncle, the fascicles laxly or more or less densely disposed on the rachis; pedicel shorter than the diameter of flowers, triquetrous. Flower-bud obovoid, slightly flattened at the top. Perianth 6-parted,

patent, light green, uninerved, glabrous, herbaceous, more or less thickish; the outer lobes oblong-lanceolate, obtuse; the inner lobes very slightly longer than the outer ones, oblong-spathulate, rounded at the apex. Stamens 6, much shorter than the perianth, erect, but curved outwards above; filament narrow, glabrous, light green; anther minute, with whitish pollen; the oppositisepalous ones broadly orbicular, auriculate at the base, the cells placed around the short connective and faced laterally; the oppositipetalous ones rounded, the cells collateral towards the front of the connective and apparently introrse. Rudimentary style very minute, shortly pyramidal, 3-lobed, connate below. ♀: Spike pendulous, 1-2 to the leaf-axil, simple or rarely few-branched, glabrous, laxly flowered; rachis slender, a little flexuous, triquetrous with smooth edges, attaining about 27 cm. in length. Flower small, very shortly pedicellate, 2-bracteate, placed in the right angle to the rachis, solitary or rarely binate, about 5 mm. across; bracts minute, sharply subulate, membranaceous. Perianth 6-parted, patent, light green, glabrous, thickish; the outer 3 linear-oblong, obtuse; the inner 3 very slightly broader than the outer ones and clavately dilated at the apex. Rudimentary stamens 6, minute, clavate, 2-fid at the top, opposite to the perianth-lobes and situated at their bases. Style erect, shorter than the perianth, divergingly 3-lobed at the top; stigma slightly dilated, longitudinally grooved. Ovary terete and triangular with entire edges, shallowly 2 grooved in faces, longer than the perianth, $3\frac{1}{2}$ - $4\frac{1}{2}$ mm. in length. Capsule ascending on the pendulous rachis, shortly pedicellate, emarginate and crowned with persistent perianth at the apex, broadly rounded at the base, 3-winged, $1\frac{1}{3}$ -2 cm. long, $1-1\frac{1}{2}$ cm. across, smooth, green, margined with thin narrow and smooth edges, with subcoriaceous thin carpels. Seeds 2 in each loculament, compressed, rounded to obovate-elliptical, winged above; wing elliptical to oblong, rounded at apex, thinly membranaceous, brown.

Dioscorea sativa Miq. Prol. Fl. Jap. p. 323, ex parte; Franch. et Sav. Enum. Pl. Jap. II. p. 47, ex parte; Kanitz Anthoph. Jap. p. 9, non Linn.

Dioscorea sp. Makino in Bot. Mag., Tokyo, II. 1888, p. 26.

Kai, vulgo *Tokoro* Kämpf. Amœn. Exot. p. 827.

Hab. Prov. Tosa: Sakawa (*T. Makino*! July, Aug. Oct. 1887), Ogawamura (*T. Makino*! July 22, 1887), Nanokawa (*K. Watanabe*! Herb. Sc. Coll. Imp. Univ. Tokyo, July 15, 31, 1889); Prov. MUSASHI: Tokyo (*T. Makino*! Aug. 6, 1893; *R. Yatabe* and *Z. Matsumura*! Herb. l. c. July 6, 1879), Ōmiya-hachiman (*R. Yatabe* and *Z. Matsumura*! Herb. l. c. July 6, 1879), Dōkwan-yama (*R. Yatabe* and *Z. Matsumura*! Herb. l. c. Sept. 28,

1879), Hachiōzi (*T. Makino!* Oct. 28, 1899), Shibuya (*T. Makino!* July 23, 1901); Prov. SAGAMI: Hakone (*T. Makino!* Sept. 24, 1886); Prov. SHIMOOSA: Mama (*T. Makino!* Aug. 8, 1888); Prov. HITACHI: Kihara (Herb. l. c.); Prov. SHIMOTSUKE: Nikkō (*R. Yatabe!* Herb. l. c. July 28, 1877); Prov. ISE: Komono (Herb. l. c. Aug. 6, 1883); Prov. SURUGA: Murayama (*R. Yatabe* and *Z. Matsumura!* Herb. l. c. July 27, 1881); Prov. UZEN: Between Mt. Gassan and Mt. Haguro (*R. Yatabe* and *S. Ōkubo!* Herb. l. c. July 24, 1887); Prov. MUTSU: Hyakutaku (*T. Iwakawa!* Herb. l. c. July 20, 1880); Prov. IWASHIRO: Aidzu (*Z. Matsumura!* Herb. l. c. Aug. 4, 1879); Prov. CHIKUZEN: Nakaharu-mura (*K. Nagano!* Herb. l. c. 1890); Prov. SUŌ: Ōuchi-mura (*D. Nakai!* Herb. l. c. July 10, 1892).

A commonest *Dioscorea*, which is very widely distributed in this country, growing on mountains, hills, and in fields. *Tokoro* is the native name.

Trachelospermum jasminoides Lem. 1851; Fl. des Serres VI. p. 263; Franch. et Sav. Enum. Pl. Jap. II. p. 438; Franch. Pl. David. I. p. 206; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 99; Maxim. in Engler's Bot. Jahrb. VI. p. 65; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 60; Palib. Consp. Fl. Kor. in Act. Hort. Petrop. XVIII. p. 157.

Rhynchospermum jasminoides Lindl. 1846; Fl. des Serres l. c. tab. 615; Walp. Ann. III. p. 920, et V. p. 498; Bot. Mag. tab. 4737; Benth. Fl. Hongk. p. 221; Franch. et Sav. Enum. Pl. Jap. I. p. 315.

Nerium divaricatum Thunb. Fl. Jap. p. 110, non Linn.

Trachelospermum divaricatum Kanitz Anthoph. Jap. 1878, p. 14; Schumann in Engl. et Prantl, Die Natürl. Pflanzenfam. IV. 2, 1895, p. 173, fig. 58, J-K; Diels in Engler's Bot. Jahrb. XXIX. p. 540.

Parechites Thunbergii A. Gray Bot. Jap. p. 403; Miq. Prol. Fl. Jap. p. 62.

Malouetia asiatica Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abh. Akad. Muench. IV. 3, 1846, p. 163.

Echites saligna Delile in herb. ex Benth. Fl. Hongk. p. 221.

Parechites adnascens Hance in Journ. Bot. 1868, p. 299.

Hab. Japan, common and widely distributed.

Leaves glabrous, or sometimes pubescent beneath.

Stellaria (Eustellaria, Larbreæ) **Uchiyamana** Makino sp. nov.

Perennial. Stem very slender, terete, often purplish, repent radican

and more or less glabrate below, and then ascending or erect, loosely ramose below or above, slender, tomentoso-pubescent with stellate white hairs. Leaves opposite, shorter than internodes, patent, ovate or rounded-ovate, mucronate or mucronato-acute, entire and ciliated, rounded or truncato-rounded at the base, very shortly petioled, thin, glabrous and green above, tomentoso-pubescent with stellate white hairs beneath, $1\frac{1}{4}$ -3 cm. long, $\frac{2}{3}$ - $2\frac{2}{3}$ cm. broad; midrib delicate; veins faint; petiole 2-3 mm. long, densely tomentoso-pubescent. Flower solitary, axillary or terminal, 1- $1\frac{1}{3}$ cm. across; pedicel filiform, erect, longer than leaves, greenish, tomentoso-pubescent with stellate hairs. Sepals a little unequal in length, ovato-lanceolate to angustato-lanceolate, acute, entire, scarious towards the margin, pubescent with stellate hairs, light green, 6 mm. long, persistent. Petals white, erect-patent, longer than sepals, very deeply 2-partite, cuneate below; lobes subspathulate-lanceolate, gradually attenuated below, obtuse, entire. Stamens 10, perigynous, shorter than petals and sepals, the alternate 5 shorter; filaments subulate-filiform, very shortly connate at base, glabrous; anther oblong-elliptical, yellowish. Ovary sessile, ovoid, 1-celled, with 6 entire and ovato-oblong valves, glabrous, greenish, $1\frac{1}{2}$ mm. long; styles 3, a little longer than the ovary, free, erect-patent. Ovules about 10, orbicular, compressed. Capsule cylindrical, a little exceeding the persistent calyx, dehiscent into 6 linear-lanceolate valves.

Stellaria? Maxim. in Mél. Biol. IX. p. 51.

Nom. Jap. *Yama-Iahobe* (Inuma's Sōmoku-Dzusetsu VIII. fol. 67, no. 66).

Hab. Prov. Iyo: Handa-mura (*T. Makino!* May 3, 1893), Saredani-mura (*Z. Unemura!* April 1897); Prov. BIRCHŪ: Takahashi (*I. Nishihara* 1901).

This is common in western Japan. It is closely allied to *Stellaria tomentosa* Maxim., but is more robust and petals are always present; and it also differs from *S. saxatilis* Ham., which has a paniculate inflorescence. I have named it in memory of Tomizirō Uchiyama, a chief horticulturist of the Botanic Garden, Science College, Imperial University of Tokyo.

Citrus Aurantium Linn. subsp. **Juncos** (Sieb.) Makino nom. nov.

Evergreen trees, attaining about 12 m. in height, numerous ramose, densely leaved, spinose; branches short; branchlets also short, patulose, green, trigonous; spines axillary, straight, spreading, shorter or slightly longer

than the petiole. Leaves oblong to oblong-lanceolate, attenuated acuminate with an emarginate tip, rounded-obtuse at base, faintly crenate, coriaceous-chartaceous, glabrous, deep green above, light green beneath, minutely pellucid-punctate, $3\frac{1}{2}$ –9 cm. long, $1\frac{2}{3}$ – $1\frac{1}{5}$ cm. broad; midrib prominent on both surfaces; veins about 5–11 on each side, patulous, curved and connecting above; veinlets inconspicuous superficially in living specimens but prominently reticulated beneath when dried; petiole winged, cuneately oblanceolate to obovate, shortly terete at the base, glabrous, 1–4 cm. long, 4–22 mm. wide. Flower axillary, or rarely terminal, pedicellate, usually solitary or sometimes geminate, about 18 mm. across, odoriferous; the pedicel about 4–18 mm. long, narrow, with laxly placed caducous subulate ciliated scale-bracts. Calyx about 8 mm. across, patent, green, persistent, 5-cleft; lobes depressed-deltoid, or deltoid, somewhat unequal in size and some of them subulato-deltoid or more or less linear-foliaceous above, a little produced and obtuse, thick, glabrous, more or less concave within, minutely ciliated. Corolla erect-patent, pure white, deciduous; petals 5, narrowly oblong-spathulate, obtuse, entire, thickish, sparsely punctate externally, about 14–15 mm. long, $5\frac{1}{2}$ –7 mm. broad. Stamens erect, shorter than the corolla, 16–21-antheriferous; filaments united into 5 bundles or sometimes sub-tubular with short and free tips, 1 to 5-antheriferous to a bundle, the bundle rectangular-spathulate, but linear-filiform in that of one-antheriferous one; anther elliptical or oblong-elliptical, introrse, shortly apiculate at top, bifid at base, yellow. Disk annular, entire, glabrous. Ovary somewhat depressed-globose, truncate at top, glabrous, thick-carpeled, 9–11-celled, many-ovuled, about $3\frac{1}{2}$ mm. across; style erect, lower than stamens, thick, cylindrical; stigma globose; ovules minute, horizontal, in 2 rows. Fruit globose, somewhat depressed, $4\frac{1}{2}$ –8 cm. across, yellow, often scarcely mammillated at top and concave in its centre, depressed at base, aromatic, the surface more or less uneven, the oil-glands sparse and slightly concave; the rind thick, white and spongy interiorly, closed to cells, 9–11-celled, with thin dissepiments; cells packed with a soft tissue of indistinct fusiform and yellowish vesicles, filled with an acid juice, the axis white and spongy; pedicel terete. Seeds usually many, oblong-obovoid, often a little compressed, smooth, pale-yellowish, about 13–17 mm. long, the rhaps more or less distinct; testa firm; tegmen membranaceous, slightly thicker and rose-coloured internally at the chalaza; embryos 1 to 4 to a seed, cotyledons white.

Citrus Medica b. *Junos* Sieb. Synops. Pl. Oeconom. Jap. in Verh. Bat. Gen. XII. 1830, p. 59.

Citrus Junos Sieb. herb. ex Miquel.

Citrus Bigaradia forma Miq. Procl. Fl. Jap. p. 15.

Citrus Aurantium Thunb. Fl. Jap. p. 293, ex parte, non Linn.

Citrus sp. (Yuzu) Makino, 1894.

Citrus Aurantium var. *Bergamia forma* (Yuzu) Makino, 1895.

Citrus Medica var. *Yuzu* Matsum. Shokubutsu-Mei-i, 1895, n. 898, in emend.

Juv., vulgo *Aje Tats banna* Kæmpf. Amœn. Exot. p. 801.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa (Herb.! Sc. Coll. Imp. Univ. Tokyo, May 31, 1881; *T. Makino!* June 1896, Dec. 1901).

Common and widely cultivated in Japan, extending from Loochoo to northern Japan. It is more hardy than any other one of *Citrus* in this country.

***Citrus Aurantium* Linn. subsp. nobilis** (Lour.) Makino.

Citrus nobilis Lour. Fl. Coch. ed. Willd. p. 569; Spreng. Syst. Veg. III. p. 334; Sieb. Synops. Pl. Oeconom. Jap. p. 59; DC. Prodr. I. p. 540; Walp. Repert. II. p. 804; Ker Bot. Regist. tab. 211; Lowe Man. Fl. Madeira I. p. 74; Brandis For. Fl. Ind. p. 51; Loud. Encycl. Pl. p. 654, fig. 10978; Bretschn. Early Europ. Res. Fl. Chin. p. 142; Miq. Procl. Fl. Jap. pp. 15, 376; Franch. et Sav. Enum. Pl. Jap. I. p. 74; F. v. Muell. Sel. Extra-Trop. Pl. ed. 1885, p. 93; Nichols. Illustr. Diet. Gard. I. p. 335, fig. 464; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 111; Bonav. Cult. Orang. a. Lemon. Ind. a. Ceyl. p. 55; Ito et Matsum. Tent. Fl. Lutch. I. p. 93; Engl. in Engl. et Prantl Die Nat. Pflanzenfam. III. 4, p. 196.

Citrus deliciosa Tenore; Edwards's Bot. Regist. New Ser. IV. 1841, Misc. Notic. p. 18, no. 44; Walp. l. c.

Citrus Aurantium var. *Mandarinum* Risso.

Citrus Aurantium Thunb. Fl. Jap. p. 293, ex parte, non Linn.

Kitz., vulgo *Tatz banna* Kæmpf. Amœn. Exot. p. 801.

Hab. Japan, common and cultivated.

There are numerous varieties and forms under cultivation, and some of them are sometimes passed into *subsp. amara* Engl. (= *C. amara* Link. = *C. Bigaradia* Loisel. = *C. vulgaris* Risso).

var. Tachibana (Makino) Makino. An *var. spinosa* (Miq.)?

Evergreen trees, attaining about 8 m. in height, densely ramose and leaved, spinose; branchlets green and trigonous-compressed, glabrous, more or less flexuous; spines axillary, patent or erect-patent, straight, shorter or longer than the petiole. Leaves petioled, oblong-lanceolate or elliptical-lanceolate, shortly attenuated towards the apex with an emarginate tip, usually acute at base, depressed crenate, coriaceous, glabrous, green above, paler beneath, minutely pellucid-punctate, 3-10 cm. long, $1\frac{1}{2}$ - $4\frac{1}{3}$ cm. broad; midrib prominent on both sides; lateral veins 5 to 9, patulous, curved and connecting above; veinlets prominently reticulated beneath when dried; petiole wingless, terete, flatly canaliculated with very narrowly marginate edges in front, 4-9 mm. long. Flowers axillary or sometimes terminal, solitary or geminate, pedicellate, about 18 mm. across, odoriferous; pedicel shorter than the flower, 3-10 mm. long, furnished with laxly placed caducous subulate ciliated scale-bracts. Calyx patent, 5-cleft, about 5 mm. across in flower, persistent; lobes broadly ovato-orbicular, slightly produced and obtuse at apex, entire, glabrous but minutely ciliated margined, thickish, somewhat concave within. Petals 5, white, erect-patent, spatulate-oblong, obtuse, entire, thicker towards the centre, sparsely punctate externally, about 12 mm. long, $4\frac{1}{2}$ mm. broad. Stamens shorter than corolla, erect, many-antheriferous; filaments united into several bundles; anther oblong-elliptical, obtuse at the apex, bifid at the base. Disk depressed. Ovary depressed-globose, glabrous, punctate, sulcate longitudinally, 2- $2\frac{1}{2}$ mm. across, 6-8-celled with thick carpels; ovules minute, 2-serial; style erect, cylindrical, glabrous, lower than stamens; stigma ovoid-globose. Fruit depressed-globose or depressed-obovoid-globose, often more or less concave at top, yellow, 2-3 cm. across, smooth, minutely punctate with numerous subepidermal oil-glands, 6-8-celled; cell packed with a soft tissue of fusiform vesicles; juice scanty, acid, or acid and slightly bitter; rind not thick, easily separable from pulp. Seeds a few to a cell of pulp, obovoid or obovoid-ellipsoidal, smooth, the rhaphe more or less distinct; testa firm; tegmen membranaceous, slightly thickish and coloured internally at the chalaza; embryos 1-3 to a seed, cotyledons greenish.

Citrus Aurantium? var. *Tachibana* Makino in Jouru. Soc. Hort. Jap. 1896, no. 75, p. 3, cum. tab.

Citrus nobilis var. *Tachibana* Makino in Sched. Herb. Sc. Coll. Imp. Univ. Tokyo.

Citrus nobilis var. *spontanea* T. Ito in T. Ito et Matsum. Tent Fl. Lutch. I. 1899, p. 94.

Citrus sp. Makino in Bot. Mag., Tokyo, III. 1889, p. 144.

Nom. Jap. *Tachibana*.

Hab. Prov. TOSA: Karatani (*T. Makino!* April 15, 1888, Dec. 1891, Oct. 1892, June 1893); Prov. TSUSHIMA: Tsutsu (*K. Nagano!* herb. Sc. Coll. Imp. Univ. Tokyo, March 1, 1895); Prov. MUSASHI: Tokyo, cult. (*T. Makino!* Dec. 1901).

This is evidently growing wild, extending from Isl. Shikoku and Kiushiu to Loochoo Archiperago. It is proved to be the original species of many cultivated ones of *C. nobilis* Lour.

Buxus sempervirens Linn. var. **japonica** (Muell. Arg.) Makino in Bot. Mag., Tokyo, IX. 1895. p. 281.

Buxus japonica Muell. Arg. in DC. Prodr. XVI. 1, p. 20; Miq. Prol. Fl. Jap. p. 292; Franch. et Sav. Enum. Pl. Jap. I. p. 428; Pax. in Engl. et Prantl Die Nat. Pflanzenfam. III. 5, p. 133; Palib. in Act. Hort. Petrop. XVIII. p. 189.

Buxus sempervirens (lapsu typogr. *virens*) Thunb. Fl. Jap. p. 77, excl. syn.; Sieb. et Zucc. in Abh. Akad. Münch. IV. 2, p. 142; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 418, non Linn.

Buxus sempervirens b. *suffruticosa* Sieb. Synops. Pl. Oeconom. Jap. 1830, p. 30.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* May 1896, April 17, 1897), Ibid. Bot. Gard. Koishikawa, cult. (Herb.! Sc. Coll. Imp. Univ. Tokyo, April 16, 1878); Prov. SHIMOTSUKE: Urayama in Nikkō (Herb.! l. c. Oct. 8, 1879); Prov. IDZU: Isl. Kōdzu-shima (*S. Ōkubo!* herb. l. c. April 27, 1887), Summit of Mt. Hachidyō-fuzi in Isl. Hachidyō (*S. Ōkubo!* herb. l. c. May 13, 1887); Prov. TOSA: Nagano near Sakawa (*T. Makino!* Spring 1892, Nov. 27, 1892).

var. microphylla Bl. in herb. Lugd.-Batav. ex Miq. l. c.; Hook. fil. Fl. Brit. Ind. V. p. 267.

Buxus microphylla Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 2, p. 142; Walp. Ann. Bot. Syst. I. p. 632; Baill. Monogr. Bux. et Styl. p. 64.

Buxus japonica β. *microphylla* Muell. Arg. l. c.; Miq. l. c.; Franch. et Sav. l. c.

Buxus sempervirens a. *angustifolia* Sieb. l. c.

Tsuge Kæmpf. Amœn. Exot. p. 781.

Hab. Prov. SHIMOOSA: Mama (Herb.! Sc. Coll. Imp. Univ. Tokyo,

April 6, 1878); Prov. AWA in Isl. Shikoku: Kamimyō-mura (*R. Yatabe!* herb. l. c. July 24, 1888); Prov. TOSA: Sakawa (*T. Makino!* April 1892)

var. liukuensis Makino in Bot. Mag., Tokyo, IX. 1895, p. 279.

A shrub; branches yellowish; branchlet puberulent. Leaves opposite, oblong-ovate, obovato-oblong, obovate, ovate, or oblanceolate, attenuated at base, emarginate, entire, thinly coriaceous, green and shining above, paler beneath, $1\frac{1}{4}$ –3 cm. broad, 3–6 cm. long including the slightly puberulent short petiole; veins many, erect-patent, branching, delicately prominent above when dried. Inflorescence axillary, cluster-flowered, furnished with a firm rounded ciliated and small bract under each flower, the female flower superior, imbricately scaly at the base of the common rachis. Male flowers very shortly pedicellate. Sepals 4, membranaceous, concave, ciliated on margin; 2 outer ones broadly ovate; 2 inner ones larger than the outer ones, orbicular, concave, $2\frac{1}{2}$ mm. in each way. Rudimentary ovary included, short, one-third as long as the inner sepals, capitately enlarged and 4-lobed at the top. Stamens 4, much exerted; filament stout; anther narrowly ovate, one-fourth as long as the filament. Capsule ovoid, smooth, hard, about 1 cm. long, with persistent styles which are suberect and a little inclined outwards, loculicidally dehiscent into 3 carpels each bearing 2 of the half style and then the endocarp separating from the epicarp. Seed oblong, black, shining.

Hab. Loosho: Mountain of Kuzi-magiri in Isl. Okinawa (*Y. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, March 1887), Shuri in *Ibid.* (*H. Kuroiwa!* Nov. 1894), Shika-mura in Isl. Ishigaki (*H. Kuroiwa!* Aug. 9, 1892, no. 25).

This is distinguished principally by the size of leaves and flowers. The rudimentary ovary well accords with the typical one of *Buxus sempervirens* Linn.; but it differs from that of *B. sempervirens* var. *japonica* (Muell. Arg.) Makino.

Aster trinervius Roxb. var. **congestus** Franch et Sav. forma **tubulosus** Makino.

Corolla of the ray-flowers augustate-tubular, often bilabiato-lobed at the mouth, the lower lobes ovate to ovato-lanceolate, the upper lobe linear and shorter than the lower one, lilac-coloured. Involucral bracts tinged with purple colour.

Hab. Prov. MUSASHI : Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino* ! Nov. 28, 1893).

***Aster trinervius* Roxb. var. *microcephalus* (Miq.) Makino.**

Stoloniferous. Stem erect, terete, densely fastigiato-ramose above. Leaves linear, acuminate, remotely mucronato-dentate, subtriplinerved. Pedicels slender: bracts linear. Involucral bracts like those of *Aster trinervius* Roxb. var. *congestus* Franch et Sav., but somewhat smaller and narrower, tinged with purple colour above. Corolla of the ray-flower also similar to those of *A. trinervius* Roxb. var. *congestus* Fr. et Sav.

Calimeris microcephala Miq. Prol. Fl. Jap. p. 101.

Aster microcephalus Franch. et Sav. Enum. Pl. Jap. I. p. 223.

Hab. Prov. MUSASHI : Tokyo, Bot. Gard. Koishikawa, cult. (*Herb.* ! Sc. Coll. Imp. Univ. Tokyo, Oct. 1878, Sept. 30, 1879 : *T. Makino* ! Sept. 1890, Oct. 3, 1893).

This is only in cultivation.

***Cimicifuga japonica* (Thunb.) Spreng. Syst. Veg. II. p. 628 ; Miq. Prol. Fl. Jap. p. 197 ; Franch. et Sav. Enum. Pl. Jap. I. p. 13 ; Huth in Engler's Bot. Jahrb. XVI. p. 316, tab. IV. fig. 21, excl. syn. β ; Id. in Bull. Herb. Boiss. V. p. 1093, excl. var. *obtusiloba* ; Makino in Bot. Mag., Tokyo, XI. 1897, p. 248, et in XIII. 1899. p. 198.**

Actæa japonica Thunb. Fl. Jap. p. 221 ; Willd. Sp. Pl. II. p. 1140 ; Pers. Syn. Pl. II. p. 61 ; Boir. Encycl. Suppl. I. p. 130 ; DC. Syst. I. p. 384, et Prodr. I. p. 65 ; Prantl in Engl. et Prantl Die Nat. Pflanzenfam. III. 2, p. 59.

Thalictrodes japonicum O. Kunze.

Pityrosperma acerinum Sieb. et Zucc. in Abhandl. Akad. Münch. III. p. 735, tab. 3, fig. 3, et in Ibid. IV. 2, p. 184 ; Walp. Repert. V. p. 7 ; Ann. d'hort. et de bot. I. p. 51, tab. 6.

Actæa acerina Prantl.

Cimicifuga japonica var. *a. acerina* Huth in Engl. Jahrb. XVI. p. 316 ; L'éveil. in Bull. Acad. Internat. Geogr. Bot. 1900, p. 217.

Cimicifuga japonica var. *ternata* Maxim. in litt.

Cimicifuga japonica var. *obtusiloba* Yatabe Iconogr. Fl. Jap. I. p. 67, tab. 21, excl. syn. non Huth.

Ōba-shōma et *Kiken-shōma* Inuma's Sōmoku-Dzusetsu X. fol. 15 verso-16 recto.

Hab. Prov. MUSASHI: Chichibu (Herb. ! Sc. Coll. Imp. Univ. Tokyo); Prov. SHIMOTSUKE: Nikko (*Z. Matsumura* ! July 29, 1885; *T. Makino* ! July 1900, Aug. 29, and Sept. 14, 1901); Prov. HITACHI: Mt. Tsukuba (*T. Makino* ! May 1897); Prov. NAGATO: Akasato-mura in Mine-gōri (*D. Nikai* ! herb. l. c. Sept. 24, 1895); Prov. IYO: Mt. Wariishi-tōge (Herb. ! l. c. Aug. 11, 1888); Prov. TOSA: Nanokawa (*T. Makino* ! Nov. 1884); Mt. Tebako (*S. Yano* ! herb. l. c. Aug. 10, 1890), Mt. Kurotaki (*T. Yoshinaga* ! Aug. 1890).

Leaves are constantly simply ternate; leaflets are shining above, rarely peltate at the base. Flowers are like in next species.

Cimicifuga biternata (Sieb. et Zucc.) Miq. Prol. Fl. Jap. p. 179; Franch. et Sav. Enum. Pl. Jap. I. p. 14; Huth in Engler's Bot. Jahrb. XVI. p. 316; Id. in Bull. Herb. Boiss. V. p. 1093.

Pityrosperma biternatum Sieb. et Zucc. in Abhandl. Akad. Münch. III. p. 736, et in Ibid. IV. 2, p. 184; Walp. Repert. V. p. 7.

Actaea biternata Prantl.

Cimicifuga japonica var. *biternata* Maxim. in litt.

Pityrosperma obtusilobum Sieb. et Zucc. ll. cc.; Walp. l. c.

Cimicifuga obtusiloba Miq. l. c.; Franch. et Sav. l. c.

Actaea obtusiloba Prantl.

Thalictrodes obtusilobum O. Kuntze.

Cimicifuga japonica var. β . *obtusiloba* Huth ll. cc. non Yatabe.

Cimicifuga heterophylla Makino in Bot. Mag., Tokyo, XI. 1897, p. 248, et XIII. 1899, p. 199.

Mitsuba-shōma Inuma's Sōmoku-Dzusetsu X. fol. 14 recto.

Inu-shōma Ibid. fol. 15 recto.

Midzufude Iwasaki's Honzō-Dzufu VII. fol. 19 verso.

Hab. Prov. MUSASHI: Dōkwan-yama (*R. Yatabe* and *Z. Matsumura* ! herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 1897; *T. Makino* ! Sept. 29, 1888, Aug. 10, 1900), Shirako (*R. Yatabe* and *Z. Matsumura* ! herb. l. c. Sept. 19, 1880; *T. Makino* ! Sept. 23, 1895), Tokyo (*R. Yatabe* and *Z. Matsumura* ! Sept. 28, 1879; *T. Makino* ! 1891, May 1897), Shimura (*T. Makino* ! May 22, 1898), Adzusawa (*T. Makino* ! May 22, 1898), Ōmiya-hachiman (*T. Makino* ! Oct. 3, 1897); Prov. HITACHI: Mt. Tsukuba (*T. Makino* !

May 1897); Prov. ISE: Onohira-mura in Ano-gōri (Z. *Umemura*! Sept. 15 and Oct. 13, 1895).

This species has dimorphic leaves, simply ternate and bi-ternate; while *Cimicifuga japonica* Spreng. bears always simply ternate leaves; they often appear on the same stock the superior ones being simply ternate and the inferior bi-ternate, but sometimes only either one of them can appear on the same stock; the bi-ternate leaves are the typical form of the two, and there various gradations between them exist. The leaves are duller and more blunt than those of *C. japonica* Spreng. This is probably a variety of *C. japonica* Spreng., as Maximowicz considered it to be so.

OBSERVATIONS ON THE FLORA OF JAPAN.

Fasciculus 2.

1902.

By

T. Makino,

*Assistant in the Botanical Institute, Science College,
Imperial University of Tokyo.*

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TOKYO

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*Assistant in the Botanical Institute, Science
College, Imperial University of Tokyo.*

Cymbidium Kanran Makino sp. nov. (1900).

Terrestrial. Pseudo-bulb not large, ovoid, attaining about 17mm. across, subterranean or nearly so; scales several, subulate-lanceolate, acuminate, membranaceous, many-nerved, carinate dorsally, imbricately and closely equitant, the largest one about 10cm. in length, at last drying away; roots fibrous, simple, thick, spongy, whitish. Leaves tufted, 4 or 3 to a bulb, recurved, linear or broadly linear, acuminate, gradually narrowed below, canaliculate in front and carinate dorsally towards the base, dilated and embracing the pseudo-bulb at the very base, coriaceous-chartaceous, but firmly coriaceous below, entire but serrulato-scabrous above, shining above, nearly concolorous beneath, 2-7 decim. long, 6-17mm. broad; midrib slender, prominent beneath; main nerves 2 to 3 on each side, hardly prominent in living specimens. Scape lateral, erect from the base of the pseudo-bulb, attaining about 25-60cm. in height including the raceme, green, often purplish, sheathing; sheaths membranaceous, narrowly lanceolate acuminate and tubular below, remotely placed above, but gradually closed and gradually decreasing in size below, imbricated in the basal ones, closely many-nerved. Raceme more or less secundly and loosely 5 to 12-flowered; rachis shorter than the peduncle, slender, terete, smooth; bracts linear, acuminate, shorter than the ovary, 3 to several-nerved, 8-28mm. long. Flowers 5-6cm across, very fragrant. Perianth viridescent, purple in centre in the inner perianth, entire, 5-nerved. Outer perianth patulous, broadly linear, very sharply acuminate; the superior (truly inferior) one 3-4cm. long, $3\frac{1}{2}$ - $4\frac{1}{2}$ mm. broad; lateral ones a little shorter than the superior one, hardly oblique in form. Inner perianth erect-patent, shorter than the outer one, lanceolato-linear, scarcely oblique in form, sharply acuminate, hardly carinate behind below, 2- nearly 3cm. long, $4\frac{1}{2}$ - $5\frac{1}{2}$ mm. broad. Labellum a little shorter than the inner perianth, horizontal, sessile with the obtuse or rounded-obtuse base, glabrous, hardly

* BOTANICAL MAGAZINE, Tokyo, Vol. XVI. (1902).

3-lobed, with narrowly 2 glabrous lamellæ between the side lobes forming a central deep longitudinal canal by conduplication, 16-25mm. long; the side lobes erect, short, entire, rounded and minutely suberose at the apex, thickish, purple-coloured, but the lower portion barred with the same colour; mid-lobe much larger, ovate or oblong-ovate, obtuse with an acutish tip, entire, reflexed, thinner, many-nerved, light green and loosely spotted with purple, 10-16mm. long, 6-10mm. broad. Gynostemium arcuate, trigonous-compressed, entire-edged, light green, spotted with purple in front, 10-14mm. long, 3-3½mm. wide; clinandrium obliquely truncate, the dorsal edge deltoid; anther hemispherical, thick above, truncate at base, sub-2-celled; pollinia 4, sessile, ovato-oval, much compressed, waxy, yellow, the gland lunate. Ovary slenderly cylindrical, shorter than the perianth, glabrous.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino!* Jan. 1902).

An allied species of *Cymbidium ensifolium* Sw., and *C. xiphiifolium* Lindl. This Orchid is most familiar to the Japanese, being admired as the noblest and most valuable plant, from the fragrance of its flowers and noble appearance of its leaves. It is found freely growing in shady forests of the warmer parts of the south-west of this country, but it is commonly cultivated in pot with care. It flowers at the beginning of winter, hence the name *Kanran*, that is Winter Orchid. There are various forms; **forma purpurascens** is one of them having the purpurascens flower.

Cymbidium alborubens Makino sp. nov.

Terrestrial. Pseudo-bulb horn-shaped or ovato-fusiform, attaining about 2cm. across, enclosing with the base of leaves; scales several, firmly membranaceous, subulate-lanceolate, acute, the superior and largest one attaining about 18cm. in length, lastly drying away and splitting into fibres; roots numerous, slender, branched, 2½-4½mm. across. Leaves densely tufted, recurved, 4 to 8 to a pseudo-bulb, elongate, linear, acuminate, very gradually attenuated below, canaliculated in front and rounded dorsally and narrowly membranaceous-edged towards the base, entire with quite smooth margins, deeply green and shining above, paler beneath, thinly coriaceous, 2-10decim. long, 1-2cm. wide; midrib slender, narrowly canaliculate above, prominent beneath; main nerves 2-4 on each side and invisible superficially in living specimens. Scape lateral, cernuous from the base of the pseudo-bulb, terete, smooth, very light green, herbaceous, encircling with sheaths,

4-5½mm. across; sheaths ample, inflated, herbaceous, thickly membranaceous, oblong-lanceolate but narrowed and tubular below, acute, entire, many-nerved, purpurascens, more or less greenish above, attaining about 14cm. in length, the lower ones gradually shorter and imbricated. Raceme cernuous, longer than the peduncle, laxly 4-12-flowered; rachis obtusely sub-angulate, glabrous, flaccid-herbaceous, very light green, slightly purple at nodes, 5-25cm. long; bracts small, deltoid-subulate, sharply pointed, entire, 3-8mm. long. Flower scentless. Perianth thickly membranaceous, white, with a rufoescent stripe in centre, with finely crisate-crenulate margins which are quite entire in aestivation. Outer perianth patent, narrowly oblanceolate, equal in length and in size, acutish and with an apiculate tip, the superior (truly inferior) one erect and the lateral ones obliquely downwards, 2½-3½cm. long, 7½-9½mm. broad. Inner perianth shorter than the outer perianth, nearly approximate to one another, narrowly lanceolate, obtuse and with a minutely apiculate tip, 2-2¾cm. long, 6-7½mm. broad. Labellum horizontal, shorter than the inner perianth, sessile with an obtuse-rounded base, thickish, 3-lobed, with 2 longitudinal pubescent white and nearly close-placed lamellæ between the side lobes, yellow at the base; side lobes erect, ovate, obtuse, entire, scarcely ciliated on the inner margin, purplish-red; the mid-lobe larger than the side lobes, much recurved, broadly ovate, obtuse with a minutely mucronate tip, purpurascens-red, but yellowish in centre. Gynostemium equalling the side lobes of the labellum in height, compressed, rounded dorsally, flat and slightly concave in front, a little arcuate, deeply purpurascens-red, 1½cm. long, 4½mm. wide; clinandrium deltoid, obliquely truncate; anther ovato-hemispherical, truncate at the base, thick at top, sub-2-celled, yellowish; pollinia 2, deeply 2-partite, sessile, obovate, compressed, waxy, yellow, disk lunato-reniform. Ovary cylindrical, somewhat enlarged above, glabrous, very light green, usually slightly longer than the perianth including the pedicel and 2½-4½cm. long. Capsule oblong-fusiform, pedicellate, beaked at top, glabrous, about 2½cm. across.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*I. Makino* ! Jan. 1902).

This amiable Orchid has also been found in Formosa. Flowers in winter in Tokyo.

Saccolabium Matsuran Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. (1892) p. 48.

Small epiphytic Orchid. Stem simple, rarely branched, about 1-4cm. long, horizontal or more or less pendulous, emitting roots below, enclosed with short sheaths of leaves throughout; roots slender, flexuous, greenish-white. Leaves distichous, approximate, patulous or erect-patent, oblong-lanceolate, or oblong-linear, or linear-lanceolate, entire, obtuse, acute at base, very shortly petioled, articulated upon the sheath, coriaceous, carnosae, usually slightly arcuate, persistent, shining, green spotted with dark-purple, 3-nerved, the lateral nerves immersed, 7-20mm. long, 2-5mm. broad. Peduncle lateral, extra-axillary, shorter than the leaves, stout-filiform, terete, slightly enlarged above, glabrous, 4-8mm. long; scales minute, remote, shortly subulate, the superior one usually shortly tubular below and placed at the middle part of peduncle. Raceme short, much shorter than the peduncle, flexuous, 1-3-flowered; bracts minute, deltoid-subulate, acute or acutish, persistent. Flower small, about 6-9mm. across. Perianth free, patulous, obtuse, entire, thickish, glabrous, 1-nerved, yellowish-viridescent, blotched with purple. Outer perianth nearly equal in length; the superior (truly inferior) one elliptical-oblong, the lateral ones narrowly oblong. Inner perianth very slightly smaller and scarcely shorter than the outer perianth, narrowly oblong. Labellum horizontal, equalling the outer perianth in length, adhering with the gynostemium at base; spur relatively large, shortly obconical, obtuse, broadly opened, thickly walled, glabrous, having a longitudinal ridge in front wall internally; limb reniform with entire and rounded side-margins, obtuse or truncate at the apex, thick and 3-nerved in centre, thin towards the margin. Gynostemium very short, stout, obtusely toothed laterally; clinandrium obliquely truncate, deltoid; rostellum 2-fid; anther hemispherical, membranaceous, glabrous, shortly produced in front, truncato-rounded at top; pollinia 2, globular; caudicle filiform or linear-filiform, much longer than pollinia; gland oblong, 2-fid at one end. Ovary cylindrical, glabrous, pedicellate. Capsule obovoid-oblong, obtusely trigonous, pedicellate, spotted with purple.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino*! Aug. 28, 1887); Prov. IDZU: Mt. Amagi (Harb.! Sc. Coll. Imp. Univ. Tokyo, April 6, 1890); Prov. IWASHIRO (*K. Nemoto*! June 1897).

This is probably the most inconspicuous and most northern species among the genus. It has the habit of *Sarcochilus japonicus* Miq.

Raphiolepis umbellata (Thunb.) Makino nom. nov.

Laurus umbellata Thunb. Fl. Jap. (1784) p. 175; Willd. Sp. Pl. II. (1799)

p. 484; Pers. Syn. Pl. I. (1805) p. 450; Spreng. Syst. Veg. II. (1829) p. 266.

Mespilus Sieboldi Bl. Bijdr. p. 1102, (1826); Walp. Repert. II. p. 54.

Photinia Sieboldi G. Don.

Raphiolepis japonica Sieb. et Zucc. Fl. Jap. I. (1835) p. 162, tab. 85, et in Abhandl. Akad. Muench. IV. 2, p. 130; Walp. Repert. II. p. 57; C. Koch in Ann. Mus. Bot. Lugd.-Bat. I. p. 250; Miq. Prol. Fl. Jap. p. 229, excl. syn. Thunb.; H. W. in Ann. Hort. et Bot. II. p. 25, cum tab.; A. Gray in Perry's Exped. Jap. p. 311, et Bot. Jap. p. 387; Decne. Mém. Fam. Pomac. p. 133; Franch. et Sav. Enum. Pl. Jap. I. p. 142; Kanitz Anthoph. Jap. p. 29; Hook. fil. in Curtis's Bot. Mag. sub tab. 5510; Benth. Fl. Hongk. p. 108, in nota; Maxim. in Mém. Biol. IX. p. 181; Engl. et Maxim. in Engler's Bot. Jahrb. VI. p. 63; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 264; Yatabe Iconogr. Fl. Jap. p. 89, tab. 25; Koehne Gatt. Pomac. p. 21, tab. 2, fig. 15, b; Focke in Engl. et Prantl Die Nat. Pflanzenfam. III. 3, p. 25; Ito et Matsum. Tent. Fl. Lutch. I. p. 191; Palib. Consp. Fl. Kor. I. p. 76.

Raphiolepis ovata Hortul. ex Decne.

Hab. Japan.

Var. Mertensii (Sieb. et Zucc.) Makino.

Raphiolepis Mertensii Sieb. et Zucc. Fl. Jap. I. (1835) p. 164, et in Abhandl. Akad. Muench. IV. 2, p. 130; Walp. Repert. II. p. 57.

Raphiolepis? integerrima Hook. et Arn. Bot Beech. Voy. (1841) p. 263; Walp. l. c.; Benth. Fl. Hongk. p. 108, in nota.

Raphiolepis japonica var. *integerrima* Hook. fil. in Curtis's Bot. Mag. tab. 5510; Maxim. in Mém. Biol. IX. p. 181; Ito et Matsum. Tent. Fl. Lutch. I. p. 192.

Hab. Japan

Var. minor Makino var. nov.

Shrub, many-ramose, densely leaved. Branches erect or ascending, terete, glabrous, but the young shoots thinly tomentose as are most young leaves. Leaves sparse throughout branchlets above, patulous, approximate, petioled, oblong-lanceolate or narrowly oblong, acutish-obtuse, acute and slightly decurrent at the base, crenato-serrate or entire, coriaceous, shining and deep-green above, paler and venose beneath, glabrous, but youngest ones thinly tomentose as mentioned above, 2-5½cm. long, 1-2¼cm. broad, persistent; petiole compressed, 4-8mm. long; stipules subulate, much shorter than the petiole, deciduous. Panicle contracted; flowers smaller.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb. ! Sc. Coll. Imp. Univ. Tokyo, May 19, 1880; *T. Makino!* May 20, 1890, May 1896).

A garden variety (?), with all its parts smaller than those of the *typica* and the *var. Mertensii*; the leaves are sparse throughout branchlets and denser, the branches much erect, and the panicles contracted.

Pseudægle trifoliata (Linn.) Makino nom. nov.

Citrus trifoliata Linn. Sp. Pl. ed. 2, (1762) p. 1101; Willd. Sp. Pl. III. (1800) p. 1428; Pers. Syn. Pl. II. (1807) p. 74; Franch. et Sav. Enum. Pl. Jap. I. p. 74; Kanitz Anthoph. Jap. p. 24; Bot. Mag. tab. 6513; Franch. Pl. Dav. I. p. 67; Engl. in Engl. et Prantl Die Nat. Pflanzenfam. III. 4, p. 195, fig. 114; Gard. Chron. 3rd Ser. XIV. p. 625, fig. 102.

Citrus trifolia Thunb. Fl. Jap. (1784) p. 294.

Ægle? *sepiaria* DC. Prodr. I. p. 538; Spreng. Syst. Veg. II. p. 598; ? Blume Bijdr. p. 140; Sieb. Syn. Pl. Oeconom. Jap. (1830) p. 58 Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 2, p. 160; Forbes et Hemsl. Journ. Linn. Soc. XXIII. p. 111; Maxim. Pl. Chin. in Act. Hort. Petrop. XI. p. 95.

Pseudægle sepiaria Miq. Prol. Fl. Jap. p. 15; Walp. Ann. Bot. Syst. VII. p. 536.

Citrus triptera Desf.

Ssi, vulgo *Karatats banna* Kæmpf. Amoen. Exot. p. 801, cum icone.

Hab. Prov. MUSASHI: Tokyo, cult. (Herb. Sc. Coll. Imp. Univ. Tokyo, May 12, 1879, April 14, 1880).

Syzygium cleyeræfolium (Yatabe) Makino nom. nov.

Eugenia cleyeræfolia Yatabe in Bot. Mag., Tokyo, VI. (1892). p. 405, tab. 13.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. from Isl. Bonin (*T. Makino!* 1893, Jan. 1902).

This species may be identical with *Syzygium Millettiana* (= *Eugenia Millettiana* Hemsl. in Journ. Linn. Soc. XXIII. p. 297. = *Syzygium odoratum* Hook. et Arn. Bot. Beech. Voyage p. 187; Benth. Fl. Hongk. p. 119; ? DC. Prodr. III. p. 260. = *Opa odorata* Lour. Fl. Cochinch. ed. Willd. p. 309).

Lilium japonicum Thunb. **var. Alexandræ** Baker in Gard. Chron. 3rd Ser. XIV. (1893) p. 86; Ibid. p. 242, fig. 44.

Lilium Alexandræ Hort. Wallace.

Lilium Ukeyuki Hort.

Forma nobilissimum Makino nov. var.

Stem stiffly erect, terete, hard, attaining about 3-9decim. in height. Leaves sparse, loosely placed, ovato-elliptical, or ovata-oblong, shortly acuminate, shortly petioled, many-nerved, firm in texture, shining. Flowers 1-3, erect, shortly pedicellate, infundibuliform, about 10cm. long and across, white, exceedingly fragrant; perianth oblong-lanceolate, with an apiculate tip and a longitudinal prominent nervous carina on the back, the inner ones broader than the outer ones; bract lanceolate. Stamens shorter than the perianth. Style erect, slightly higher than stamens.

Nom. Jap. *Tamoto-yuri*.

Icon. Iinuma's Sōmoku-Dzusetsu V. no. 72.

Hub. Isl. Kuchino-shima in Tokara Archipelago (ex S. Tashiro).

A very rare and highly valuable Lily.

Tulipa edulis Baker var. **latifolia** Makino var. nov.

Leaves shorter and broader, variegated in centre on the upper surface. Perianth nearly as in the type. Stamens equal in length, slightly lower than the style; anthers shorter.

Orithyia oxypetala Savat. in Iinuma's Sōmoku-Dzusetsu V. no. 83, non Kunth.

Hab. Prov. Ise, common in the northern part (ex Y. Iinuma).

Cucumis Melo Linn. var. **Conomon** (Thunb.) Makino (1894).

Fruit oblong-cylindrical, slightly enlarged above, rounded or truncate-rounded at both ends, the largest one attaining 60cm. in length, 15cm. in diameter, smooth, pale green; carpel thick and firm; pulp not sweet.

Cucumis Conomon Thunb. Fl. Jap. (1784) p. 324; Willd. Sp. Pl. IV. (1805) p. 612; Pers. Syn. Pl. II. (1807) p. 594; Spreng. Syst. Veg. III. p. 46; Ser. in DC. Prodr. III. p. 301; Sieb. Syn. Pl. Oeconom. Jap. p. 41; Miq. Prol. Fl. Jap. p. 13; Franch. et Sav. Fl. Jap. I. p. 175.

Nom. Jap. *Shiro-uri*, *Asa-uri*.

Hab. Japan, commonly cultivated.

"*Conomon*" was derived from "*Kōnomono*" which is commonly used as a subordinate food to "*Meshi*," or boiled rice, but "*Kōnomono*" is a provision principally prepared from the roots of *Raphanus sativus* Linn.

Cymbidium Hoosai Makino sp. nov.

Terrestrial. Pseudo-bulb not large, subterranean or nearly so, ovoid or ovoid-conical, slightly compressed, entirely enclosed by the bases of leaves, attaining about 2 cm. across; scales stout, subulate, acuminate, entire, equitant, thickly membranaceous, carinate dorsally, glabrous, green, the superior one attaining about 13 cm. in length; roots fibrous, thick, terete, simple, whitish, 4-6 mm. across. Leaves tufted, 2-4 to a pseudo-bulb, erect-patent or recurved, narrowly lanceolate, acuminate with a sharp tip, gradually narrowed towards the base, canaliculated in front below, dilated and embracing the pseudo-bulb with the very base, hardly or finely scabrous, chartaceous-coriaceous but hard and thick towards the base, shining and flat and deep green above, concolorous beneath, 25-50 cm. long, 15-32 cm. wide; midrib very slender, prominent beneath; lateral main veins 2 on each side, the inner one being stouter and somewhat prominent beneath in living specimens; veinlets inconspicuous. Scape attaining about 60 cm. in height including the raceme, exceeding the leaves, lateral, erect from the base of the pseudo-bulb, slender, terete, purple or greenish; scales membranaceous, but more or less thickish in the inferior ones, the upper ones very remotely placed, linear-lanceolate, acuminate, closely many-nerved, shortly tubular below, the inferior ones subulate and gradually decreasing in size and gradually close-placed below. Raceme shorter than the peduncle, 7-20 cm. long, laxly and secundly 2-6-flowered; rachis terete, subflexuous, glabrous, smooth, purple or viridescent; bracts shorter than the ovary, subulate or subulate-lanceolate, acuminate, entire, membranaceous, 5-14 mm. long, 3-7-nerved, purple or viridescent. Flowers $3\frac{1}{2}$ -6 cm. across, slightly odoriferous or not. Perianth greenish-purple, with deeper purple nervous lines. Outer perianth patent and then reflexed, equal in size, oblanceolate-linear, entire, obtuse or acutish with a minute cuspidate point, $2\frac{1}{2}$ - $3\frac{1}{2}$ cm. long, 5- $6\frac{1}{2}$ mm. broad, the upper one 5-nerved, the lateral ones 6-nerved and scarcely carinate dorsally. Inner perianth-leaves horizontal, closely placed to one another, shorter than the outer ones, lanceolate, acute or acutish, entire, 9-nerved, 2- $2\frac{2}{3}$ cm. long, 6-9 mm. wide. Labellum horizontal, shorter than the perianth, sessile, rounded at the base, very scarcely trilobed, the side-lobes erect, entire and rounded-edged, purple towards the margin and irregularly bared below; mid-lobe much reflexed, oblong-ovate, rounded-obtuse, entire and more or less crispate, thicker towards the centre, yellowish, or very light green and then yellowish, transversely and irregularly blotched with purple, 10-16 mm. long, 9- $11\frac{1}{2}$ mm. broad; disk thick, with thick glabrous yellowish or white and then yellowish lamellae between the side lobes, forming a

deep canal between them. Gynostemium stout, 12–14 mm. long, $3\frac{1}{2}$ –5 mm. broad, compressed, slightly arcuate forwards, flat and marked with longitudinal purple spots, purple at top; clinandrium deltoid, obliquely truncate, obtuse at the dorsal edge; anther hemispherical, slightly compressed from the front, truncate at the front margin, with an indentation at the dorsal edge, subbilocular, yellow; pollinia 4, sessile, much compressed, oval, waxy, yellow, the gland lunato-deltoid, thin. Ovary cylindrical, shorter than or equal to the perianth including the pedicel, glabrous, purple or greenish. Flowers January–March.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino!* Feb. 1902).

This species was formerly introduced from Ryūkyū, but it is now found freely growing in Formosa.

Forma Hakuran is only a form, having the slightly thinner and more acuminate leaves, and usually the fewer and a little smaller and lighter-coloured flower.

Potentilla (Sect. I. A. Lehm.*) **Miyabei** Makino sp. nov. (1898).

Tufted? about 5 cm. high in my specimen, covered with adpressed pale hirsute hairs. Stem very short, erect, ligneous, leafy. Leaves dense, petioled, flabellately simple-ternate; leaflets sessile, obovato-spathulate to oblong-spathulate, cuneate towards the base, truncate and coarsely 3-dentate with equal acute or acutish and deltoid or ovato-deltoid teeth at apex, thickly membranaceous, concolorous, the middle one a little larger and 9–16 mm. long; petiole stout-filiform, shorter or more or less longer than the blade; stipule relatively large, broad, membranaceous, adnate below, the upper free portion subulate-lanceolate to subulate-deltoid, acuminate, entire, longer than the adnate portion in the superior leaves. Peduncle erect, exceeding the leaves, loosely branched; bracts leaf-like and usually stipulate but smaller, the superior ones much decreasing in size and linear. Flowers pedicellate, about $1\frac{1}{2}$ cm. across, yellow. Calyx persistent, 5-partite; lobes spreading but suberect in fruit, lanceolate, acute-acuminate, entire, trinerved at the base and reticulated-veined above, 6–8 cm. long; tube short, flat, hirsute below internally; bracteoles 5, linear, acutish, about measuring a half length of calyx-lobes. Petals 5, scarcely exceeding the calyx-lobes, orbiculate, rounded at top, entire,

* Lehmann Revisio Potentillarum p. 3.

very shortly unguiculate, with a fine venation, about 7 mm. long, deciduous. Stamens rather numerous, loosely placed on the calyx-tube, shorter than the calyx-lobes; filaments filiform, glabrous; anther small, ovato-orbicular. Ovaries many, small, ovoid, clothed with long pale hairs; style erect, lateral, filiform, glabrous, scarcely higher than hairs of the ovary; stigma terminal, not thick; receptacle small, shortly ovato-conical. Achenes ovoid, very slightly compressed laterally, covered with long pale hairs and persistent style, about $1\frac{2}{3}$ mm. long; carpel hard.

Potentilla tridentata var. Miyabe.

Hab. Prov. KUSHIRO in Hokkaidō: Mt. Meakan (*T. Kawakami!* August 1897).

This species differs in respects from *Potentilla tridentata* Soland. and *P. ambigua* Camb., though the leaflets of all three species are 3-dentate at the apex, like those of *Sibbaldia procumbens* Linn.

I have named it in honour of Dr. Kingo Miyabe, Professor of Sapporo Agricultural College, and my thanks are due to Mr. Takiya Kawakami, who collected it and sent me kindly.

Potentilla ancistrifolia Bunge Enum. Pl. Chin. Boreal. p. 25, no. 145; Lehm. Revis. Potentil. p. 43, tab. 18; Maxim. in Bull. Nat. Mosc. (1879) p. 17; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 240; Franch. in Bull. Soc. Bot. France, XXVI. p. 83.

Potentilla Dickinsii Franch. et Sav. Enum. Pl. Jap. II. p. 337.

Hab. Prov. MUSASHI: Mt. Yōkami (*T. Makino!* July 16, 1888); Prov. SHIMOTSUKE: Nikkō (Herb! Sc. Coll. Imp. Univ. Tokyo, June 20, 1878; *T. Makino!* 1900); Prov. IWASHIRO: Yumoto in Aizu (*Z. Matsumura!* herb. ibid. Aug. 4, 1879); Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *Z. Matsumura!* herb. ibid. July 12, 1884); Prov. HIDAKA in Hokkaidō: Samani (*Y. Tokubuchi!* herb. ibid. Aug. 8, 1892); Prov. IYO: Mt. Ishidzuchi (*T. Makino!* Aug. 1885); Prov. TOSA: Mt. Yokogura (*T. Makino!* 1884).

Potentilla ternata (Maxim.) Makino, non C. Koch.

Potentilla fragarioides γ. *ternata* Maxim. in Mém. Biol. IX. p. 159; Franch et Sav. Enum. Pl. Jap. II. p. 337.

Hab. Prov. MUSASHI: Tokyo (*R. Yatabe* and *Z. Matsumura!* herb.

Sc. Coll. Imp. Univ. Tokyo, April 17, 1879), Ōzi (*R. Yatabe* and *Z. Matsumura*! herb. ibid. May 4, 1879), Shimura *T. Makino*! 1901); Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *Z. Matsumura*! herb. ibid. July 11, 1884) Prov. ISHIKARI in Hokkaidō: Tsukisappu, Sapporo (*K. Miyabe*! herb. ibid. June 9, 1884); Prov. TOSA: Sakawa (*T. Makino*!), Mt. Sasagamine (*T. Makino*! May 3, 1893).

Akebia pentaphylla Makino nom. nov. = *A. lobata* × *quinata*.

A glabrous deciduous climbing shrub. Stem dextrorse, slender, terete, finely striate when dried, woody, brown, disparsed with minute lenticels, remotely with reduced branches; bud-scales imbricated, ovate or ovato-orbicular, deciduous. Leaves remotely alternate, but those of reduced lateral branches 3-5-fasciculate, long petioled, 5-3-foliolate; leaflets unequal in size, petiolulate, oblong to orbicular-ovate, emarginate and minutely setaceo-apiculate, obtuse to truncato-subcordate or sometimes acute and broadly cuneate at the base, entire or pauci-repand-crenate, chartaceous, green and more or less shining above, paler beneath, sub-5-nerved, $1\frac{1}{2}$ - $8\frac{1}{2}$ cm. long, $\frac{2}{3}$ - $7\frac{1}{2}$ cm. broad; veins very loose, veinlets reticulated; petiole strict, enlarged and usually curved at the base, 2- $11\frac{1}{2}$ cm. long; petiolules $\frac{1}{3}$ - $3\frac{1}{3}$ cm. long. Raceme 9-13 cm. long, cernuous or pendulous, axillary on reduced lateral branches, glabrous, with a slender peduncle, 2-3 cm. in diameter at the portion of the male flowers, provided with a few distant and long pediceled female flowers below the males; rachis shorter than the peduncle; bracts minute, subulate; pedicels of the males 6-12 mm. long, filiform, erect-patent or patulous, not reflexed. Flowers monœciously unisexual. Male flowers numerous, 4-5 mm. across; sepals, 3, oval, obtuse, concave, reflexed, purplish, $4\frac{1}{2}$ -5 mm. long, 3-4 mm. broad. Stamens 6, erect, incurved, $3\frac{1}{2}$ - $4\frac{1}{2}$ mm. long; anther oblong, obtuse, with a very short filament, cells linear and extrorse. Rudimentary pistils 3-5, minute, erect, narrow. Female flowers few on each raceme, about 2 cm. across; sepals 3, patent, orbicular, deeply concave internally assuming a hemispherical form, thickish, purple; pedicel $2\frac{1}{2}$ - $5\frac{1}{2}$ cm. long. Rudimentary stamens 6, minute, broadly oblong, truncato-obtuse at the top. Ovaries 3-5, sessile, radiately erect-patent, oblong-cylindrical, about 5 mm. long, with a terminal and discoidal stigma. Fruit oblong, about 9 cm. long, violaceous.

Akebia lobata β. *pentaphylla* Makino in Bot. Mag., Tokyo, V. (1891) p. 329, et XII. (1898) p. 195.

Hab. Prov. TOSA: Karatani in Ainogō (*T. Makino*! Dec. 1891),

Sōdayama (*T. Makino!* Nov. 1892), Ogawa-mura (*T. Makino!* Nov. 1892); Prov. SETSU: Suma (*T. Makino!* May 1, 1893); Prov. SAGAMI: Hakone (*T. Makino!* Sept. 25, 1886); Prov. HITACHI: Mt. Tsukuba (*T. Makino!* April 6, 1894); Prov. Awa (BōSHŪ): Mt. Kiyosumi (*T. Makino!* April 1898).

This is frequent in this country. It is probably to be considered as the hybrid of *Akebia lobata* Decne. and *A. quinata* Decne., as above mentioned.

Osmanthus japonicus Sieb. Syn. Pl. Oecon. Jap. (1830) p. 36. = ?
O. Aquifolium × *fragrans*.

Evergreen tree, attaining about 7m. in height, many ramose and densely leaved; trunk grey, dispersed with corky protuberances; branches terete, glabrous, grey-white, scattered with small lenticels. Leaves patent, petiolate, decussate, loosely approximate towards the top of branchlets, elliptical or elliptical-oval, shortly acuminate, obtuse or acutish at base, coarsely spinoso-dentate with many teeth, but the superior ones pauci-spinoso-dentate or quite entire, rigidly coriaceous, glabrous, deep green and shining above, paler beneath, 5–11½ cm. long, 2½–7 cm. wide; midrib prominent beneath; lateral veins about 8–10 on each side, erect-patent, delicately prominent beneath, straight or slightly arcuate upwards and connected above; veinlets inconspicuous superficially, loosely reticulated; petiole semiterete, glabrous, 7–13 mm. long. Inflorescence axillary or sometimes terminal. ♂: Flowers white, fragrant, 8–10 mm. across; pedicels fasciculate, longer than the flower, filiform, glabrous, 5–11 mm. long; scales small, ovato-orbicular, obtuse or mucronate, entire-margined, subglabrous, thick, concave, often carinate dorsally. Calyx minute, 1½ mm. across, patelliform, 4-lobed, glabrous, thin towards the edges; lobes ovate or ovato-hemispherical, obtuse or acute, minutely suberose. Corolla glabrous, deeply 4-partite; lobes patent or reflexed, obovato-elliptical or oblong, slightly oblique, rounded at the apex, entire, thickish, the tube very short and broad. Stamens 2, erect, inserted to the middle part of the corolla-tube, shorter than the corolla-lobes, 2½–3 mm. long; filament narrow, a little longer than the anther; anther oval, obtuse at apex, auriculate at base, the connective large. Rudimentary pistil minute, erect, ovato-subulate, acute or acutish at the tip. ♀: Flower yet unknown to me.

Osmanthus Aquifolium var. *japonicus* Makino in herb. Sc. Coll. Imp. Univ. Tokyo.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cultivated (Herb! Sc. Coll. Imp. Univ. Tokyo, Oct. 17, 1878; *T. Makino!* April 21, and Autumn 1890, Feb. 1902), Komaba, Bot. Gard. Agric. Coll. Imp. Univ. Tokyo, cult. (*T. Makino!* Feb. 1902); Prov. Iyo: Matsuyama, cult. (*K. Okudaira!* Nov. 27, 1897).

This may be the hybrid between *Osmanthus Aquifolium* Sieb. and *O. fragrans* Lour., as given above, having leaves and flowers which are just intermediate to them. It is only known in cultivation.

Osmanthus fragrans Lour. **var. aurantiacus** Makino.

Tree. Leaves patent, lanceolate, acuminate, acute at base, interruptedly serrulate or entire, 7–16 cm. long, $1\frac{1}{2}$ – $4\frac{1}{2}$ cm. or sometimes more wide, coriaceous; midrib prominent beneath; veins loose and also prominent beneath. Inflorescence axillary. ♂: Flower orange-coloured, exceedingly fragrant, fasciculate, with filiform pedicel longer than the flowers themselves. Calyx minute, 4-lobed; lobes often unequal, subdeltoid, minutely suberose. Corolla patent, about 8 mm. across, deeply 4-parted; lobes obovate-oblong, obtuse, entire thick. Stamens 2, inserted to the corolla-tube; filament extremely short; anther ovato-orbicular, longer than the filament. Rudimentary pistil minute, erect, oblong-subulate, pointed upwards. ♀: Flower not yet seen.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb! Sc. Coll. Imp. Univ. Tokyo, Oct. 15, 1879; *T. Makino!* Oct. 1890, Oct. 1897, Oct. 4, 1898).

This has formerly been introduced from China next to the *typica*, and now is commonly cultivated. The *typica* has whitish flowers.

Var. latifolius Makino.

Branches erect or ascending. Leaves decussate, erect-patent, or patulous, loosely approximate towards the top of branchlets, petiolate, oblong, abruptly acuminate, obtuse at the base, uninterruptedly serrulate but entire at the base, glabrous, coriaceous, deep green above, paler beneath, $6\frac{1}{2}$ –13 cm. long, $2\frac{2}{3}$ –6 cm. wide; midrib prominent beneath; veins 5–7 on each side, loose, prominent beneath, erect-patent, arcuate upwards; veinlets rather loosely reticulated; petiole semiterete, 8–13 mm. long. Flowers white.

Hab. Prov. TOSA: Sakawa, cult. (*T. Makino!*); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino!* Feb. 1902), Id. Ushigome, cult. (*T. Makino!* Feb. 1902).

This variety differs from the *typica* and *var. aurantiacus*, by having the uninterruptedly serrulate, wider, more rigid, and deeper green leaves. That in Curtis's Botanical Magazine, tab. 1552, may be identical with this variety.

Rhododendron Hymenanthes (Bl.) Makino nom. nov.

Hymenanthes japonica Bl. Bijdr. p. 862 (1826).

Rhododendron Metternichii Sieb. et Zucc. Fl. Jap. I. (1835) p. 23. tab. 9, et in Abhandl. Akad. Muench. IV. 3, (1846) p. 130; DC. Prodr. VII. p. 721; Miq. in Ann. Mus. Bot. Lugd.-Bat. I. p. 32, et Prol. Fl. Jap. p. 95; A. Gray in Perry's Exped. Jap. p. 315, et Bot. Jap. p. 430; Maxim. Rhod. As. Orient. p. 21; Franch. et Sav. Enum. Pl. Jap. I. p. 287; Boissieu in Bull. Herb. Boiss. V. p. 916.

Rhododendron maximum Thunb. Fl. Jap. p. 181, excl. syn., non Linn. *Sekki nan*, vulgo *Saku Nange* Kœmpf. Amœn. Exot. p. 877.

a. heptamerum.

Rhododendron Metternichii a. heptamerum Maxim. l. c.; Makino in Bot. Mag., Tokyo, X. p. 211.

Hab. Prov. TOSA: Tadzikawa (*T. Makino!* May 1893), Mt. Kurotaki (*K. Watanabe!* Oct. 6, 1891; *T. Makino!* Nov. 1892); Prov. IYO: Mt. Ishidzuchi (*T. Yoshinaga!* Aug. 1888);? Prov. BUZEN: Mt. Inugadake (*R. Yatabe* and *Z. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 18, 1882).

β. pentamerum.

Rhododendron Metternichii β. pentamerum Maxim. l. c. p. 22; Makino l. c.

Hab. Prov. SHIMOTSUKE: Nikkō (Herb. Sc. Coll. Imp. Univ. Tokyo, June 1878), Mt. Shirane in Nikkō (*N. Ichikawa!* herb. ibid. Aug. 17, 1887); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb. ibid. April. 19, 1884; *T. Makino!* Apr. 20, 1894); Prov. IDZU: Mt. Amagi (*K. Watanabe!* May 25, and Aug. 6, 1897).

forma angustifolia Makino.

Leaves denser, angustato-lanceolate, acutish-obtuse, attenuated below, ferrugineo-lanate beneath, 4-16 cm. long, $\frac{1}{3}$ -2 cm. broad.

Rhododendron Metternichii β. pentamerum forma angustifolia Makino l. c. p. 212.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb. Sc. Coll. Imp. Univ. Tokyo, May 8, 1880; *T. Makino!* May 1899).

It is said that this form grows on mountains of northern boundaries in provinces of Mikawa and Tōtōmi.

Maackia Tashiroi (Yatabe) Makino nom. nov.

Cladrastis Tashiroi Yatabe in Bot. Mag., Tokyo, VI. (1892) p. 345, tab. 10; Matsum. in Ito et Matsum. Tent. Fl. Lutch. I. p. 169.

Hab. ISL. AMAMI-ŌSHIMA (*S. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 1887), Yuwan-mura (*S. Tanaka!* herb. ibid. Aug. 15, 1891), Between Naze and Yamato-hama (T. Itō! herb. ibid. July 16, 1894), Yakiuchi (Herb. ! ibid.); ISL. OKINAWA (*Z. Matsumura!* herb. ibid.); ISL. IHEYA (*H. Kuroiwa!* herb. ibid. Aug. 1898); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino!* July 26, and Sept. 27, 1895.)

Glycine (*Soja*) **Soja** (Linn.) Benth. in Journ. Linn. Soc. VIII. (1865) p. 266; Baker in Hook. fil. Fl. Brit. Ind. II (1879) p. 184, non Sieb. et Zucc.

Dolichos Soja Linn. Sp. Pl. p. 727; Cod. no. 5351; Thunb. Fl. Jap. p. 282; Houtt. Nat. Hist. XXVIII. (1779) p. 158; Willd. Sp. Pl. III. p. 1051; Pers. Syn. Pl. II. p. 298; Spreng. Syst. Veg. III. p. 251; Lour. Fl. Cochinch. ed. Willd. p. 537; Roxb. Fl. Ind. III. (1832) p. 314; Debeaux Fl. Shang-hai p. 81.

Soja hispida Mœnch.; DC. Prodr. II. p. 396; Bunge Enum. Pl. Chin. Bor. p. 94, no. 118; Wight et Arn. Prodr. Fl. Pen. Ind. Or. I. p. 247; Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abh. Akad. Muench. IV. 2, p. 119, no. 15; Regel Tent. Ussur. p. 52; Miq. Prol. Fl. Jap. p. 240; Id. Fl. Ind. Bat. I. p. 223; Hoffm. et Schult. Nom. indig. Pl. Jap. ed. nov. (1864) p. 56; Maxim. Prim. Fl. Amur. p. 87; Bretschn. Early Eur. Res. Fl. Chin. pp. 27, 97, et 146; Debeaux Fl. Tien-tsin p. 41.

Glycine hispida Maxim. in Mém. Biol. IX. p. 70 (1872); Franch. et Sav. Enum. Pl. Jap. I (1875) p. 108; Franch. Pl. David. I. p. 100; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 188; Taub. in Engl. et Prantl Die Nat. Pflanzenfam. III. 3, pp. 360, 361, fig. 131, B-D; Henry in Transact. Asiat. Soc. Jap. XXIV. Suppl. p. 34; Matsum. in Ito et Matsum. Tent. Fl. Lutch. I. p. 153.

Soja japonica Savi (1824).

Sooja japonica Sieb. Syn. Pl. Oecon. Jap. p. 56.

Daidso Kæmpf. Amœn. Exot. p. 837, cum tab.

Hab. Japan, widely cultivated, having various forms. There not any wild form in Japan.

“*Soja*” was derived from “*Shōyū*” or Soy, a kind of sauce made of boiled seeds of this plant and fermented wheat, commonly used by the Japanese.

Glycine (*Soja*) **ussuriensis** Regel et Maack in Regel Tent. Fl. Ussur. p. 52, tab. 7, fig. 5–8.

Glycine Soja Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abh. Akad. Muench. IV. 2, p. 119, no. 14; Walp. Ann. I. p. 970; Miq. Prol. Fl. Jap. p. 240; Franch. et Sav. Enum. Pl. Jap. I. p. 108 et II. p. 326; Franch. Pl. David. I. p. 100; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 188; Taub. in Engl. et Prantl Die Nat. Pflanzenfam. III. 3, p. 360; Palib. Consp. Fl. Kor. I. p. 69.

? *Soja angustifolia* Miq. Fl. Ind. Bat. I. p. 223; Walp. Ann. IV. p. 552.

? *Johnia javanica* Zoll. herb. non Wight et Arn. ex Miq.

? *Glycine javanica* Thunb. in Trans. Linn. Soc. II. (1794) p. 340, non. Linn.

Phaseolus lathyroides Houtt. Nat. Hist. XXVIII. p. 141, tab. 63, fig. 2, ex parte, non Linn.

Hab. Prov. SHIMOOSA: Mama (*T. Makino!* Oct. 6, 1895); Prov. MUSASHI: Tokyo (*Z. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 31, 1880), Shimura (*T. Makino!* Sept. 7, 1893); Prov. MUTSU: Awomori (*T. Iwagawa!* herb. ibid. Aug. 22, 1880); Prov. IYO: Ishite (*Z. Umemura!* Sept. 12, 1897).

This species is never in cultivation, and the seed grains are useless, hence as the specific name “*Soja*” given to it is very inappropriate. Probably a variety of the preceding species.

Dunbaria villosa (Thunb.) Makino in Herb. Sc. Coll. Imp. Univ. Tokyo, (1897).

Glycine villosa Thunb. Fl. Jap. (1784) p. 283; Pers. Syn. Pl. II. (1807) p. 300; Willd. Sp. Pl. III. p. 1056; Spreng. Syst. Veg. III. (1826) p. 198; DC. Prodr. II. (1825) p. 242.

Atylosia villosa Maxim. in Mém. Biol. IX. p. 69.

Atylosia subrhombea Miq. Prol. Fl. Jap. p. 239; Franch. et Sav. Enum. Pl. Jap. I. p. 112, et II. p. 327; Kanitz Anthoph. Jap. p. 31.

Dunbaria subrhombea Hemsl. in Journ. Bot. (1876) p. 207; Id. in Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 195; Palib. Consp. Fl. Kor. I. p. 71.

Hab. Prov. MUSASHI: Tokyo (Herb. ! Sc. Coll. Imp. Univ. Tokyo); Prov. IYO: Nishiidzumi (*K. Watanabe!* herb. ibid. Sept. 24, 1891), Komatsu (*K. Watanabe!* herb. ibid. Sept. 27, 1891); Prov. SUO: Ōuchimura (*D. Nikai!* herb. ibid. Aug. 26, 1892).

***Gentiana scabra* Bunge var. *Buergeri* Maxim. subvar. *angustifolia* Makino** in Bot. Mag., Tokyo, X. (1896) p. 313.

Rhizome short, erect, or oblique; roots thickish. Stems caespitose with 2-3, erect, simple, slender, terete but tetragonous-terete above, glabrous, often purplish, attaining about 60 cm. in height. Leaves opposite, sessile, linear, acuminate, usually longer than internodes, but the inferior ones lanceolate-linear obtuse and shorter than the superior ones, entire and usually subtilely scabrous on the margin, thickly herbaceous, but coriaceous when dried, glabrous, green above, paler beneath, obscurely triplinerved. Flowers 1-4-aggregate at the top of the stem and axillary above, the size form and colour as in those of the var. *Buergeri*, but the tip of corolla-lobes more acute.

Hab. Prov. MIKAWA: Kameyama-mura in Atsumi-gōri (*T. Makino!* Oct. 27, 1893), Hosotani-mura (*T. Makino!* Oct. 28, 1894), Takashi-mura (*T. Makino!* Oct. 29, 1894).

This differs from the typical one and the var. *Buergeri*, by its linear leaves, having the habit of the European *Gentiana Pneumonanthe* Linn.

***Alpinia* (Catimbium) *Kumatake* Makino** sp. nov.

Rhizome perennial. Leafy stem erect, slender, attaining about 3½ m. in height. Leaves oblong-lanceolate, shortly acuminate, narrowly acute below, subsessile, long-sheathed, about 54 cm. long, 13½ cm. broad, chartaceo-coriaceous, shining above, nearly concolorous, glabrous on both surfaces, densely and shortly ciliated on the entire and subcallose margin, but free at the lower; ligule short, ovate, obtuse, ciliated; sheath narrow, coriaceous, but thin-edged, ciliated on the upper margin. Panicle erect, narrow, raceme-like, rather loosely flowered, about 15 cm. long; rachis slender, glabrous

as well as the peduncles; peduncles short, erect-patent or patulous, not stout, bearing 2-3-crowded flowers towards the top, the inferior ones about $1\frac{1}{2}$ cm. long; bract at the base of the peduncle, 3-6 mm. long except the few lower ones, obovate, enerved, scarious, even and smooth-margined, glabrous, deciduous, the lower ones (a few in number) largest and $6-12\frac{1}{2}$ cm. long, angustato-lanceolate, often thickish-membranaceous; bracteoles relatively large, orbicular, naviculate, entirely enveloping the flower-bud, rounded at top, entire and smooth edged, but often slightly ciliated at top, glabrous, loosely nerved, deciduous. Flower about 4 cm. long. Calyx laxly sub-campanulato-tubular, membranaceous, glabrous, loosely nerved, shortly 3-lobed, about 13 mm. long; lobes somewhat unequal-sized, oval-ovate or semiorbicular, rounded or emarginate and ciliated at the apex. Corolla tubular below; the tube cylindrical, slightly shorter than the calyx, about $2\frac{1}{2}$ mm. across in the middle, with a minute puberulent elevated ridge under the lateral staminode-lobe; lobes longer than the tube and about $1\frac{1}{2}$ cm. long, oblong, rounded-obtuse and thinly ciliated at the apex, white, membranaceous, transparent towards the margin, glabrous, loosely nerved, the upper one a little larger. Lip patent, sessile, broadly ovate, about $2\frac{3}{4}$ cm. long, 2 cm. broad, truncato-rounded at the base, usually bifid at the apex, suberoso-crispate on the upper margin but even-sided below, thickened longitudinally in the middle portion, but membranaceous on both sides, white, shaded yellow, numerous and divergingly veined scarlet near the centre, the main nerves closely placed in centre, the lateral veins numerous, patulous and delicate; lateral lobes small, subulato-linear, about 5 mm. long. Stamen about 2 cm. long; filament filiform-linear, flattened but conduplicate, glabrous; anther square-rectangular, truncate at top, auriculate below, about $7\frac{1}{2}$ mm. long, the cells linear, with thick walls; rudimentary stamens 2, erect, oblong, emarginate, glabrous, thick, $2\frac{1}{2}-3$ mm. long. Style a little exceeding the stamens, filiform, thinly pubescent towards the top, white; stigma oblongly peltate, with a fissure and ciliated margin. Ovary ellipsoidal, glabrous, $4\frac{1}{2}$ mm. long.

Alpinia Galanga Savat. in Inuma's Sōmoku-Dzusetsu, ed. 2, I. fol. 10 recto, no. 9, non Sw.

Alpinia chinensis Franch. et Sav. Enum. Pl. Jap. II. p. 20, non Rose. Nom. Jap. *Kumatake-ran*.

Icon. Iwasaki's Honzō-Dzufu X. fol. 5 verso-6 recto; Inuma's Sōmoku-Dzusetsu I. fol. 10 recto.

Hab. Prov. Kiu: Inami, cult. (*J. Matsumura* and *S. Ūkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, July, 22, 1883).

Native of China; it was early introduced into this country. It evidently differs from *Alpinia chinensis* Rosc., to which Franchet erroneously referred it, as cited above.

Alpinia (Catimbium) **speciosa** (Wendl.) K. Schumann Fl. Kaiser-Wilhelmsland p. 29, et in Engler's Bot. Jahrb. (1899) p. 284, tab. 3. fig. A B.

Zerumbet speciosum Wendl. (1798).

Costus Zerumbet Pers. Syn. Pl. I. (1805) p. 3.

Alpinia nutans Rosc. in Transact. Linn. Soc. VIII. (1807) p. 346; Ait. Hort. Kew. ed. 2, I. (1810) p. 4; Rœm. et Schult. Syst. Veg. I. (1817) p. 20, Add. p. 562, et Mant. (1822) p. 19; Spreng. Syst. Veg. I. (1825) p. 14; Roxb. Fl. Ind. I. p. 65; Bot. Mag. tab. 1903; Wight Ic. tab. 2027; Benth. Fl. Hongk. p. 348; Baker in Hook. fl. Fl. Brit. Ind. VI. p. 256; Nichols. Ill. Dict. Gard. I. p. 54, fig. 62; K. Sch. in Engl. Bot. Jahrb. (1888) p. 195; Peters. in Engl. et Prantl Nat. Pflanzenf. II. 6, p. 23; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 94, non *Globba nutans* Linn.

Hab. FORMOSA: Kelung (*T. Makino* and *C. Ōwatari!* herb. Sc. Coll. Imp. Univ. Tokyo, Oct. 31, 1896; *T. Makino!* herb. ibid. Nov. 1, 1896); RYŪKYŪ: Onnah in Isl. Okinawa (*J. Matsumura!* herb. ibid. April 1897); AMAMI-ŌSHIMA: A mountain road near Urakami (*I. Katsuge!* Sept. 17, 1901).

Alpinia (Autalpinia) **bilamellata** Makino sp. nov.

Rhizome perennial(?) Leafy stem erect. Leaves bifarious, oblong-lanceolate, very shortly petiolate, rather abruptly and diminitively acuminate at the apex, obtuse at the base, entire, margined with very narrow colourless and very minutely scabrous border, but smooth on the lower margin, chartaceous, quite glabrous on both surfaces, green above, more or less paler beneath, with considerably close-placed veins, about 35 cm. long or more, 9 cm. broad or more; ligule slightly longer than the petiole, ovate, obtuse, subcoriaceous, pubescent outwards; sheath long, coriaceous, smooth-margined. Panicle erect, about 16 cm. long, narrowly pyramidal, loosely branched; rachis flexuous, softly pubescent above; branches ascending, softly pubescent, the lowest one longest and about 4 cm. long; bracts caducous; bracteoles

ovato-lanceolate, acuminate, membranaceous, embracing, finely pubescent dorsally, loosely nerved, the upper ones much smaller, about 2-3 mm. long, elliptical, membranaceous. Flowers about 1-3-crowded, about $3\frac{2}{3}$ cm. long, erect, with a short and pubescent pedicel 5-9 mm. long. Calyx loosely, campanulato-tubular, unequally 3-lobed, membranaceous, finely pubescent (denser below) externally, about 1 cm. long, laxly nerved; lobes semiorbicular-ovate, obtuse or mucronato-obtuse or minutely suberose at the apex, minutely subciliated, the one of them smaller. Corolla much exerted; finely pubescent externally; the tube equal to calyx in length, 3-4 mm. across in the middle; longer than the tube, $1\frac{1}{2}$ cm. long, erect-patent, oblong-spathulate, obtuse or acutish-obtuse at the apex, concave within, firmly and thickly membranaceous but thinly membranaceous towards the margin, the posterior one about 10-nerved and cucullate-navicular and with a cusp on the back of the apex, the other two about 7-8-nerved. Lip longer than the corolla-lobes and about $2\frac{1}{3}$ cm. long, sessile, oblong-subspathulate, nearly 1 cm. wide at the middle, cut down to the middle into 2 oblong and obtuse-tipped 2-lobules with a close sinus, glabrous, membranaceous, but thicker in centre, furnished with sublunate decurrent minutely pubescent longitudinal 2 lamellæ at the base; lateral lobes minute, deltoid, obtuse, about 1 mm. long. Stamen lower than the lip, but exceeding the corolla-lobes; filament flattened, linear, glabrous, 9 mm. long; anther relatively large, oval, 9 mm. long, $6\frac{1}{2}$ mm. broad; the connective broad, 2-cleft above into acutish-obtuse-tipped lobes, minutely puberulent; anther-cells linear, shorter than the connective, thickly walled; rudimentary stamens 2, small, enclosed within the base of the corolla-tube, erect, oblong-lanceolate, obtuse, compressed, glabrous, about $3\frac{1}{2}$ mm. long. Style a little exceeding the stamen, filiform, glabrous; stigma shortly subinfundibuliform with a transverse mouth, thicker at the one side, sub-ciliated-edged. Ovary obovato-rounded, softly pubescent, 4-5 mm. long.

Hab. ISL. BONIN [MUNIN] (Herb. ! *Yoshio Tanaka*).

Alpinia (*Autalpinia*) **chinensis** (Koen.) Rose. in Trans. Linn. Soc VIII. (1807) p. 346; Benth. Fl. Hongk. p. 349; Benth et Hook. fil Gen Pl. III. p. 648; Peters. in Engl. et Prantl Nat. Pflanzenf. II. 6, p. 24

Languas chinensis Koenig (1783).

Heritiera chinensis Retz. (1791).

Hellenia chinensis Willd. Sp. Pl. I. (1797) p. 5; Pers. Syn. Pl. I.

(1805) p. 2; Rœm. et Schult. Syst. Veg. I. (1817) p. 23; Spreng. Syst. Veg. I. (1825) p. 14.

Galanga minor Rumph.

Maranta Galanga β. Lam. Dict. Enc. méthod. II. (1790) p. 587.

Nom. Jap. *Ao-no-kumatakeran* (green-sheathed *Alpinia*).

Icon. Iwasaki's Honzō-Dzuffu, X. fol. 3 verso-4 recto.

Hab. Prov. TOSA: Isl. Kashiwa-zima (*T. Makino!* Sept. 1881, Oct. 29, 1885); Prov. IZU: Mt. Higashi-yama in Isl. Hachidyō-zima (*S. Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, May 12, 1887); RYŪKYŪ: Kunchan in Isl. Okinawa (*J. Matsumura!* herb. ibid. April 1897); Prov. MUSASHI: Tokyo, cult. from Amami Ōshima (*T. Makino!* August 19, 1895).

Remarkable for having the slenderly linear lateral staminode-lobes turned towards the stamens and horizontally placed beyond them.

***Alpinia* (Autalpinia) *boninsimensis* Makino sp. nov.**

Like *A. chinensis* Rose., but peduncle simply or dichotomously pediceled; pedicels about 8–10 mm. in length and 1-flowered; the lip of the flower shortly unguiculate, emarginate; lateral staminode-lobes erect, linear-lanceolate, obtuse; fruit obovato-globose.

Globba Hura Hook. et Arn. Bot. Beechey's Voy. p. 271, non Roxb.?

Nom. Jap. *Shima-kumatakeran* (insular *Alpinia*).

Hab. ISL. BONIN (Herb. *Yoshiro Tanaka!*; Herb. *Sc. Coll. Imp. Univ. Tokyo,* March 1879).

This is perhaps the Bonin plant mentioned by Bentham in the remark to *Alpinia chinensis* in his *Flora Hongkongensis*, p. 349. Leaves similar to the latter species.

***Alpinia* (Autalpinia) *japonica* (Thunb.) Miq. Ann. Mus. Bot. Lugd.-Bat. III. (1867) p. 140, et Prol. Fl. Jap. p. 304; Franch. et Sav. Enum. Pl. Jap. II. p. 20; Peters. in Engl. et Prantl Nat. Pflanzenf. II. 6, p. 24.**

Globba japonica Thunb. Fl. Jap. (1784) p. 23; Pers. Syn. Pl. I. (1805) p. 4; Willd. Sp. Pl. I. (1797) p. 154; Rœm. et Schult. Syst. Veg. I. (1817) p. 32; Spreng. Syst. Veg. I. (1825) p. 15.

San Dsioka, vulgo *Janma Mjoga* Kœmpf. Amœn. Exot. p. 827.

Nom. Jap. *Iiana-myōga* (flowering *Alpinia*).

Icon. Iwasaki's Honzō-Dzuzu X. fol. 4 verso-5 recto; Iinuma's Sōmoku-Dzusetzu I. fol. 11 recto.

Hab. Prov. TOSA: Kamibun (*T. Makino!* Dec. 1891), Ōhira (*T. Makino!* Nov. 1892), Ochi (*T. Makino!* May 1889, June 1893); Prov. HIZEN: Suwayama in Nagasaki (*T. Uchiyama!* herb. Sc. Coll. Imp. Univ. Tokyo, May 16, 1879); Prov. SATSUMA: Shiroyama (*T. Uchiyama!* herb. ibid. May 22, 1879); Prov. KŪ (Herb. *!* ibid. July 29, 1885), Hongū (*J. Matsu-mura* and *S. Ōkubo!* herb. ibid. July 29, 1883); Prov. AWA (Bōshū): Mt. Kiyosumi (*S. Ōkubo!* herb. ibid. June 13, 1882).

ANALYTICAL KEY TO JAPANESE SPECIES OF *Alpinia*
(EXCLUSIVE OF *A. Galanga* Sw., *A. formosana*
K. Sch. AND *A. intermedia* Gagn.).

- | | | | |
|---|---|---|---------------------------------|
| 1 | { | Leaves pubescent on both surfaces | <i>A. japonica</i> Miq. |
| | | Leaves glabrous on both surfaces | 2. |
| 2 | { | Leaves densely ciliated on the upper margin | 3. |
| | | Leaves quite glabrous on the margin | 4. |
| 3 | { | Panicle cernuous with pubescent rachis | <i>A. speciosa</i> K. Sch. |
| | | Panicle erect, with glabrous rachis | <i>A. Kumatake</i> Makino. |
| | | Rachis and peduncles in panicle pubescent; lip deeply
2-lobed, 2-lamellate at base | <i>A. bilamellata</i> Makino. |
| 4 | { | Rachis and peduncles in panicle glabrous; lip emar-
ginate, without lamella | 5. |
| | | Pedicels 1-2 mm. long; lip sessile, the lateral staminode-
lobes slenderly linear and horizontally turned towards
the stamens | <i>A. chinensis</i> Rose. |
| 5 | { | Pedicels 8-10 mm. long; lip shortly unguiculate, the
lateral staminode-lobes linear-lanceolate and erect. | <i>A. boninsimensis</i> Makino. |

Curcuma (*Exantha*) **aromatica** Salisb.; Roem. et Schult. Syst. Veg. I. Mant. (1822) p. 42; Spreng. Syst. Veg. I. (1825) p. 10, et IV. 2, p. 7; Wight Ic. Pl. Ind. Orient. tab. 2005; Berg Charakt. ed. 2, p. 14, tab. 14, fig. 140; Drury Usef. Pl. Ind. ed. 2, p. 169; Baker in Hook. fil. Fl. Brit. Ind. VI. p. 210; Peters. in Engl. et Prantl Nat. Pflanzenf. II. 6, p. 19.

Curcuma Zedoaria Roxb. Fl. Ind. I. p. 23; Bot. Mag. tab. 1546; Lindl. Med. et Econ. Bot. p. 49, non Rose.

Curcuma longa Franch. et Sav. Enum. Pl. Jap. II. p. 20, non Linn.

Nom. Jap. *Kyōwō*; *Haru-ukon*.

Icon. Iwasaki's Honzō-Dzufu X. fol. 15 verso-16 recto; Iinuma's Sōmoku-Dzusetu I. fol. 5 recto, no. 4.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cultivated.

Perhaps it was early introduced from China.

Curcuma (*Mesantha*) **longa** Linn. Sp. Pl. p. 2, Cod. no. 13; Houtt. Nat. Hist. XXV. (1777) p. 33; Willd. Sp. Pl. I. p. 14; Ait. Hort. Kew. ed. 2, I. (1810) p. 9; Pers. Syn. Pl. I. p. 4; Rœm. et Schult. Syst. Veg. I. (1817) p. 31, Add. p. 575, et Mant. (1822) p. 44; Spreng. Syst. Veg. I. p. 10; Rose. in Trans. Linn. Soc. VIII. p. 355; Lour. Fl. Cochinch. ed. Willd. p. 11; Roxb. Fl. Ind. I. p. 32; Sieb. Syn. Pl. Œcon. Jap. (1830) p. 18; Zoll. Syst. Verz. Ind. Archip. I. p. 72; Miq. Fl. Ind. Bat. III. p. 595, et Prol. Fl. Jap. p. 305; Lindl. Med. et Œcon. Bot. p. 48, fig. 82; Berg Pharm. Bot. (1860) p. 213; Royle et Headl. Mat. Med. ed. 4, p. 649; Seem. Fl. Vit. p. 291; Drury Usef. Pl. Ind. ed. 2, p. 169; Benth. et Trim. Med. Pl. tab. 269; Nichols. Ill. Gard. Dict. I. p. 411; Reinecke in Engl. Bot. Jahrb. XXV. (1898) p. 598; Baker in Hook. fil. Fl. Brit. Ind. VI. p. 214; K. Schumann in Engl. Bot. Jahrb. (1888) p. 195, (1899) p. 335; Peters. in Engl. et Prantl Nat. Pflanzenf. II. 6, p. 19; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 94; Burkill in Journ. Linn. Soc. XXXV. p. 56.

Curcuma domestica Rumph.

Amomum Curcuma Jacq.

Curcuma macrophylla Sieb. ex Miq.

Curcuma longa var. *macrophylla* Miq. Prol. Fl. Jap. p. 305; Franch. et Sav. Enum. Pl. Jap. II. p. 20.

Nom. Jap. *Ukon*.

Icon. Iwasaki's Honzō-Dzufu X. 16 verso-17 recto; Iinuma's Sōmoku-Dzusetu I. fol. 3 verso-4 recto, no. 3.

Hab. FORMOSA: Kelung (*T. Makino* and *C. Ūwatari!* herb. Sc. Coll. Imp. Univ. Tokyo, Nov. 2, 1896); RYŪKYŪ: Ōgimi in Isl. Okinawa (*J. Matsumura!* herb. ibid. May 1897); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb. ! ibid. Sept. 7, 1880).

This was formerly introduced from China, but it is now known to grow in Formosa and Ryūkyū.

Odontochilus Tashiroi (Maxim.) Makino in Bot. Mag., Tokyo. XIV. (1900) p. 141.

Anæctochilus Tashiroi Maxim. in Mém. Biol. XII. p. 546.

Hab. RYŪKYŪ: Mountain of Ōgimi in Isl. Okinawa (*S. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, March 1887).

Microtis parviflora R. Br. Prodr. p. 321; Spreng. Syst. Veg. III. p. 713; Bot. Mag. tab. 3377; Benth. Fl. Austral. VI. p. 347; Makino in Bot Mag., Tokyo, VIII. (1894) p. 172.

Microtis unifolia Kränzl. in Engler's Bot. Jahrb. VI. p. 55.

Hab. YAEYAMA ARCHIP. (*Y. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1887); ISL. HACHIDYŌ: Ōka-gō (*S. Ōkubo!* herb. ibid. May 13, 1887); Prov. SUŌ: Miyano-mura (*D. Nikai!* herb. ibid. May 25, 1890); Prov. IYO: Edoyama (*K. Okudaira!* May 29, 1892, June 5, 1894), Takanoko (*K. Okudaira!* May 26, 1895), Near Matsuyama (*Z. Umemura!* June 6, 1897); Prov. ŌSUMI: Isl. Sakura-zima (*T. Itō!* April 20, 1895); Prov. KADZUSA: Ichinomiya (*T. Makino!* Aug. 1901).

Distrib. Australia, New Caledonia, the Indian Archipelago, and South China (after Bentham).

Platanthera (Bifoliæ, Diphyllæ*) **Matsudai** Makino sp. nov.

Variable in height, 10–32 cm. height. Tuber slenderly elongate, subvertical; roots fibrous, thick, few. Stem erect, slender, glabrous, with cataphylls at base. Leaves: the basal normal ones 2, approximate, subopposite, patent, ovato-orbicular to elliptical, obtuse, rounded at base, sessile, shortly sheathed, membranaceous, glabrous, 2–5½ cm. long, 1½–3½ cm. wide, lateral veins several on each side, transverse veinlets loose and many and irregularly anastomosing; those of peduncle 2–4, much reduced in size, bract-like, distantly placed, erect, without sheaths, the lower one lanceolate, the upper subulate or linear. Raceme shorter than the peduncle, erect, narrow, 1½–7½ cm. long, 7–9 mm. across, densely or sub-densely several-numerous-flowered; rachis narrow; straight, glabrous; bracts subulate or subulate-linear, acuminate, longer than or equal to the ovary and embracing it, 1 or sub-3-nerved. Flowers small, erect, 4 mm. across, viridescent. Outer perianth oblong, obtuse, membranaceous, 1-nerved: the upper one sometimes a little shorter and

* F. Kränzlin, Orchidacearum genera et species, I. p. 619.

broader; the lateral ones patent. Inner perianth shorter than the outer, ovato-orbicular or elliptical, often somewhat oblique in form, entire, rounded at apex, concave, thin or thickish, 1-2-3-nerved, about 1-1½ mm. long. Labellum shorter than the outer perianth, but slightly longer than the inner perianth, ovato-orbicular or orbicular, obtuse, entire, often thick, concave, glabrous; calcar short, shorter than the labellum, oblong, obtuse at apex, straight or a little curved outwards, glabrous, vertically placed. Gynostemium very short, broad, $\frac{3}{5}$ - $\frac{4}{5}$ mm. long. Ovary nearly sessile, oblong-cylindrical, 4-5 mm. long, glabrous, shortly curved at the top.

Hab. Prov. UZEN: Mt. Gassan (*R. Yatabe* and *S. Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, July 23, 1887, *forma pygmaea*); Prov. ECHIGO: Mt. Myōkō-zan (*S. Matsuda!* July 28, 1894, *forma major*).

A rare mountain Orchid. It has the appearance of *Herminium Monorchis* R. Br. I have named it in honour of Mr. Sadahisa Matsuda, Assistant in the Botanical Institute, Science College, Imperial University of Tokyo, who kindly sent me a specimen collected by himself.

Herminium Monorchis R. Br. in Ait Hort. Kew. ed. 2, V. p. 191; Spreng. Syst. Veg. III. p. 694; Ledeb. Fl. Alt. IV. p. 171, et Fl. Ross. IV. p. 73; Nyman Syl. Fl. Europ. p. 361; Regel Tent. Fl. Ussur. p. 158; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 600; Sowerby's Engl. Bot. IX. p. 109, tab. 1466; Benth. Handb. Brit. Fl. ed. 5, p. 446; Hook. fil. Fl. Brit. Ind. VI. p. 128; Korsh. in Act. Hort. Petrop. XII. p. 397; Pfitzer in Engl. et Prantl Natur. Pflanzenfam. II. 6, p. 91, fig. 91, B, C; Kränzl. Orchid. Gen. et Sp. I. p. 532, 929; Finet in Bull. Soc. Bot. France, (1900) p. 277, et in Rev. génér. Bot. XIII. (1901) p. 518.

Ophrys Monorchis Linn. Sp. Pl. p. 947, Cod. no. 6851; Houtt. Nat. Hist. XXX. p. 518; Willd. Sp. Pl. IV. p. 61.

Orchis Monorchis Crantz.

Satyrium Monorchis Pers. Syn. Pl. II. p. 507.

Arachnites Monorchis Hoffm.

Hab. Prov. KUSHIRO in Hokkaidō: Tottori-mura (*T. Kawakami!* Aug. 1897).

Orchis (*Androrchis*) **Joo-Iokiana** Makino sp. nov.

About 15-30 cm. in height. Tuber single, ellipsoidal, entire, about

10–13 mm. long, sessile; fibrous roots short, not many. Stem erect, slender, leafy, with cataphylls at the base. Leaves erect, 2 or 3, laxly placed, broadly linear, acuminate, sometimes acute in the lower one, membranaceous, even-sided, glabrous, the lower one usually sheathing at base the upper ones without sheaths and embracing the stem with its sessile base, the uppermost one reduced in size, the main lateral veins 1–2 on each side, the largest one about 10 cm. long, $1\frac{1}{5}$ cm. broad. Raceme 2–7 cm. long, loosely and secundly 2–8-flowered; rachis gracile, glabrous; bracts linear or linear-lanceolate, acuminate, entire, membranaceous, often obtuse at the base, longer than the ovary, the largest one about $3\frac{1}{2}$ cm. long, 6 mm. broad. Perianth ovato-lanceolate, entire, membranaceous, with 3 main nerves, violet. Outer perianth: the upper one erect, obtuse, scarcely shorter than the lateral ones; the lateral ones much deflexed dorsally, obtuse, oblique in form, 9–11 mm. long, 4– $4\frac{1}{2}$ mm. wide. Inner perianth directed forwards, shorter than the outer perianth, acutish, 7–9 mm. long, $4\frac{1}{2}$ mm. broad. Labellum sessile, patent, horizontal, broadly orbiculate, widely truncate at the base, shortly trilobed with nearly equal rounded lobes and right-angled sinuses, emarginate at the midlobe, membranaceous, usually crenulato-denticulate on the margin, radiately veined, 10–13 mm. long, 12–15 mm. wide, violet, spotted deep purple at the base; calcar a little longer than the ovary, horizontal, narrowly cylindrical, obtuse-tipped, scarcely arcuate, glabrous. Gynostemium erect, 3– $3\frac{1}{2}$ mm. long, connected to the calcar below, subretuso-rounded at top; anther semiorbiculate. Ovary cylindrical, 10–14 mm. long including the pedicel.

Orchis Morio? Makino in Bot. Mag., Tokyo, XIV. (1900) p. 184. non Linn.

Hab. Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *J. Matsu-mura*! herb. Sc. Coll. Imp. Univ. Tokyo, July 12, 1884; *S. Ikeno*! July 20, 1892); Prov. SHIMOTSUKE: Mt. Nyohō (*K. Jō* and *B. Ioki*! July 1900; *T. Makino*! Sept. 7, 1901).

An allied species to *Orchis Morio* Linn. having beautiful flowers. I have named it in honours of Dr. Kazuma Jō and Mr. Bunsai Ioki.

***Anemone narcissiflora* Linn. *shikokiana* Makino var. nov.**

Perennial, attaining about 27 cm. in height. Leaves tufted, long-petiolate, orbicular-reniform in outline, cordate at base, 4–8 cm. long $4\frac{1}{2}$ –9 cm. wide, trisected, herbaceous, not thick, pubescent along the nerves

on both surfaces and ciliated-margined; the divisions broadly obovato-cuneate, sessile, 3-cleft with closed or narrow sinuses; the segments cuneate, flabellately inciso-dentate with mucronate ovato-lanceolate or ovato-deltoid teeth; petiole 10-16 cm. long, thinly piloso-pubescent with patent hairs, lanceolate-vaginate at the base. Peduncle erect, exceeding the leaves, thinly piloso-pubescent as in the petiole. Involucral leaves 3, sessile, 3-partite; segment cuneate, laciniate-dentate. Cyme umbellate, compound. Pedicels longer than the involucral leaves but much shorter than the peduncle, 3-5 in number, some of them often again divided into 2nd 2-3-pedicels above and bearing lanceolate or 2-3-lobed 2 involucel-leaves. Flowers 17-22 mm. across, white. Sepals 5-6, patent, oblong, attenuated below. Stamens numerous, much shorter than the sepals; anther oval-orbicular; filament linear. Ovaries about 4, sessile, glabrous, with a short style.

Hab. Prov. Iyo: Mt. Ishidzuchi (*I. Doi!* Aug. 1891; *K. Okudaira!* Aug. 1892).

The compound umbellate inflorescence is the characteristic of this species.

Hesperis lutea Maxim. in Mém. Biol. IX. p. 12, et in Act. Hort. Petrop. XI. p. 52; Franch. et Sav. Enum. Pl. Jap. II. p. 282; Diels in Engler's Bot. Jahrb. XXIX. p. 359.

Hab. Prov. SHIMOTSUKE: Gōdo (*R. Akiyama!* July 4, 1901), Ashio (*R. Akiyama!* July 7, 1901).

Rare in Japan. My specimens were kindly sent to me by Mr. Renzō Akiyama, who collected them in the above mentioned localities. This has the longest fruit among Japanese Cruciferae.

Paeonia obovata Maxim.

a. typica Makino in Bot. Mag., Tokyo, XII. (1898) p. 302.

Leaves usually hairy beneath. Flower rose-purple.

Paeonia obovata Maxim. Prim. Fl. Amur. p. 29; Regel in Bull. Soc. Mosc. XXXIV. p. 134; Id. Tent. Fl. Ussur. p. 13; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 109; Baker in Gard. Chron. New. Ser. XXI. (1884) p. 779; Forbes et Hemsl. Journ. Linn. Soc. XXIII. p. 22; Korsh. in Act. Hort. Petrop. XII. p. 302; Huth in Engler's Bot. Jahrb. XIV. p. 266; Id. in Bull. Herb. Boiss. V. p. 1095; Diels in Engler's Bot. Jahrb. XXIX. p. 324.

Paeonia oreogeton S. Moore in Journ. Linn. Soc. XVII. p. 376.

Hab. Japan; various localities.

β . **japonica** Makino l. c.

Leaves entirely glabrous. Flower always white.

Paeonia albiflora Miq. Prol. Fl. Jap. p. 197, ex parte, non Pall.

Nom. Jap. *Yama-shakuyaku*.

Hab. Prov. TOSA: Mt. Tebako (*K. Naganuma*! Aug. 1885; *I. Doi*! Aug. 10, 1890), Mt. Kuishi in Tadzikawa-mura (*T. Makino*! May 6, 1893), Nagasaka-mura in Nanokawa (*K. Watanabe*! May 6, 1888); Prov. HITACHI: Mt. Tsukuba (*T. Makino*! May 27, 1900).

Hylomecon japonicum (Thunb.) Prantl.

a. typicum Makino in Bot. Mag., Tokyo, XII. (1898) p. 16.

Hylomecon japonicum Prantl in Engler et Prantl Nat. Pflanzenfam. III. 2, p. 139; Diels in Engler's Bot. Jahrb. XXIX. p. 353.

Chelidonium japonicum Thunb. Fl. Jap. (1784) p. 221; Willd. Sp. Pl. II. p. 1142; Pers. Synops. Pl. II. p. 61; Poir. Suppl. II. p. 209; DC. Syst. Veg. p. 100; Id. Prodr. I. p. 123; Spreng. Syst. Veg. II, p. 570; Ann. d'Hortic. et de Bot. Pays-Bas, II. p. 113, cum tab.; Palib. Consp. Fl. Kor. I. p. 23.

Chelidonium japonicum var. *typica* Prain in Bull. Herb. Boiss. III. (1895) p. 584.

Stylophorum japonicum Miq. Prol. Fl. Jap. p. 199; Franch. et Sav. Enum. Pl. Jap. I. p. 27; Baker et Moore in Journ. Linn. Soc. XVII. p. 378; Bot. Mag. tab. 5830; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 34.

Chelidonium uniflorum Sieb. et Zucc. in Abh. Akad. Muench. IV. 2, p. 171; Walp. Ann. I. p. 956; Regel in Bull. Soc. Mosc. XXXIV. p. 134; Id. Teut. Fl. Ussur. p. 20; Id. Gartenfl. (1862) p. 89, tab. 355; Korsh. in Act. Hort. Petrop. XII. p. 305.

Hylomecon vernale Maxim. Prim. Fl. Amur. p. 36, tab. 3.

Hab. Prov. MUSASHI: Shimura (Herb.! Sc. Coll. Imp. Univ. Tokyo, April 25, 1881; *C. Ōwatari*! herb. ibid. May 1897; *T. Makino*! May 13, 1888, May 1, 1891, April 14, 1894), Ōzi (*T. Makino*! April 14, 1891), Hiratsuka-zinsha (Herb.! ibid. May 1, 1878), foot of Mt. Bukō (*J. Matsumura* and *R. Yatabe*! herb. ibid. April 30, 1878), Mt. Mitake (*Y. Yabe*! herb. ibid. May 15, 1900); Prov. SHIMOTSUKE: Nikkō (Herb.! ibid.); Prov. HITACHI: Mt. Tsukuba (*T. Makino*! May 1897).

β. dissectum (Franch. et Sav.) Makino in Bot. Mag., Tokyo, XII. p. 16.
Segments of leaves laciniated or incised pinnatifid; lobes unequal, inciso-serrate. Flower as in the *typica*.

Stylophorum japonicum var. *dissectum* Franch. et Sav. l. c.

Chelidonium japonicum var. *dissecta* Prain l. c. p. 584.

Hab. Prov. HITACHI: Mt. Tsukuba (*T. Makino!* May 1897).

There is the gradation to the *typica*.

γ. lanceolatum (Yatabe) Makino l. c.

Radical leaves similar to the *typica*. Segments of the cauline leaves lanceolate, acuminate, regularly serrulate with numerous sharp teeth, the largest one attaining about 9 cm. long and $2\frac{3}{4}$ cm. broad in flower, but about 13 cm. long and 4 cm. broad in fruit; lateral veins more regular, many. Flower and fruit are as in the *typica*.

Stylophorum lanceolatum Yatabe in Bot. Mag., Tokyo, VI. (1892) p. 308.

Hab. Prov. ETCHŪ: Iwase (Herb.! Sc. Coll. Imp. Univ. Tokyo, July 21, 1884); Prov. HITACHI: Mt. Tsukuba (*C. Ōwatori!* herb. ibid. May 13, 1895; *T. Makino!* May 1897, May 1900); Prov. MUSASHI: Mt. Mitake (*J. Matsumura, Y. Yabe* and *S. Matsuda!* herb. ibid. May 15, 1900).

This variety sometimes passes into the *typica*. On Mt. Tsukuba, three forms as given above are found associated.

Rubus Thunbergii Sieb. et Zucc. var. **simplicifolius** Makino var. nov.

Under-shrub, attaining about 5 decim. or more in height. Branches slender, terete, flexuous, covered with glandular purple hispidulous hairs and eglandular white pubescent hairs intermixed with laxly placed patent straight prickles. Leaves simple, orbicular, ovato-orbicular, or broadly ovate, often subtrilobed in those of shoot, obtuse, or shortly acute, cordate at base, unequally serrate or mucronato-crenate or often also scarcely lobed, sparsely pubescent and ciliated with eglandular hairs, thin, herbaceous, rugose, $\frac{3}{2}$ - $7\frac{1}{2}$ cm. long, $\frac{1}{2}$ - $7\frac{1}{2}$ cm. broad, deciduous, or rarely partly persistent; midrib as well as veins prominent beneath; veins 3-6 on each side, erect-patent but the lowest one spreading and branched outwards, reaching to the margin; petiole shorter than the blade, semiterete, shallowly canaliculate in front, covered with sparse glandular hispidulous hairs and eglandular pubescent hairs; stipules adherent by its base to that of the petiole, ovate to lanceolate, or linear-lanceolate, somewhat oblique in form, acute, or acuminate, entire, pubescent and ciliated with eglandular hairs,

viridescent, thin, herbaceous, pinnately veined, 3–6 mm. long, 1–3 mm. wide, persistent. Flower solitary on the top of axillary peduncles, white, 3–3½ cm. across, the bud ovato-globose, truncate at base; peduncle solitary, narrow, straight or hardly flexuous, about 3–6 cm. long, leafy, the lower leaves rudimentary, the basal scales small and subulate. Calyx 5-parted in the normal one, but sometimes 6–8-parted, dispersed with glandular patent purple hispidulous hairs and eglandular fine pubescent hairs outwards, about 2–2½ cm. across, persistent; sepals patent, reflexed after anthesis, oval, broadly ovate, or oblong-ovate, entire, obtuse with a setose acumen at the apex, tomentose above, thickish, green, tinged with purple. Petals 5, but sometimes 6–8, patent, longer than the sepals, ovato-orbicular or broadly ovate, shortly unguiculate, rounded at the apex, entire, deciduous, 12–15 mm. long, 9–13 mm. wide. Stamens very numerous, unequal in length, the outer ones longer and spreading, and the inner ones erect-patent, the longest ones equalling the sepal in length, glabrous; filament filiform, white; anther minute, oblong-elliptical, pale-yellow, about 1 mm. long. Ovary-cluster globose, very shortly stipitate on the broad conical viridescent disk which lines the calyx-tube and is pubescent above with white soft hairs, about 3 mm. across, pale-viridescent; receptacle ovoid-globose, naked; ovaries numerous, densely placed, minute, narrowly obovate, sessile, glabrous, viridescent; style terminal, equal to or scarcely longer than the ovary, filiform, glabrous, white, with a terminal stigma. Fruit..... Fl. April.

Hab. Prov. MIKAWA: Kaifuku, cult. (*G. Nagura!* May 20, 1895); Prov. MUSASHI: Tokyo, cult. (*T. Makino!* April 21, 1902).

This well-marked variety is found rarely in the middle Japan, and it is said to grow on Mt. Fuzi, prov. Suruga. The leaves are simple, wherefore this plant seems to differ very much from the *typica*, which has a compound leaf. It is figured and described (in Japanese) in the inedited arboreous part of Yokusui Iinuma's "Sōmoku-Dzusetsu."

Chrysanthemum indicum Linn. var. **hibernum** Makino var. nov.

Stem erect, attaining about 6 decim. in height, stouter, woody below, thinly pubescent with addressed hairs, ramose throughout, flexuous and more or less angulate above; branches erect-patent. Leaves ovate in outline, gradually decreasing in size and at length passing into bracts above, petiolate, pinnatifid with a few lobes and narrow obtuse sinuses, truncate

at the base, the largest one about $4\frac{1}{2}$ cm. long, $3\frac{1}{2}$ cm. wide; the lower lobes pauci-lobulate on the outside and dentate, the upper lobes dentate with mucronato-ovate teeth, very thinly pubescent beneath, green but often shaded with purple; stipules often conspicuous, flabellately incise-lobed. Heads approximate, about 3 cm. across. Involucral-bracts patulous, viridescent, margined with very thin and scarious darkish edges, obtuse, the outer ones smaller and subulate-lanceolate, the middle ones deltoid-ovate, the inner ones gradually longer and oblong-spathulate. Flowers bright yellow. Ligulate flowers patent, often more or less reflexed, a little unequal in length, oblong-ligulate, obtuse and with one or two minute notches at the apex, with 2 folds on surface, 10–14 mm. long including its tubular portion, $3\frac{1}{2}$ – $4\frac{2}{3}$ mm. wide. Disk-flowers numerous, collectively depressed hemispherical, the corolla considerably developed, exserted, 7–10 mm. long; lobes 5, patulous, deltoid-lanceolate acute, genital organs included. Ovaries minute.

Hab. Prov. TOSA: Kōshi, cult. (*T. Makino!* Dec. 1892); Prov. MUSASHI: Tokyo, cult. (*T. Makino!* 1894, 1901).

A remarkably and distinctly marked variety in garden, having its disk-flowers developed considerably. This seems to have been cultivated in Japan from the former times, and it is called by the name of *Kankiku*, or Winter Chrysanthemum.

The typical one of *C. indicum* Linn., is common and grows wild in the southwestern Japan, and the variety *boreale* Makino (var. nov.) is found in the middle Japan. The description of the latter one will soon appear here.

Orchis Chondradenia (Maxim.) Makino nom. nov.

Chondradenia Yatabei Maxim. in litt.; Matsum. Catal. Pl. Herb. Sc. Coll. Imp. Univ. Tokyo, (1886) p. 287, et Shokubutsu-Mei, ed. 2, (1895) p. 78; Makino in Bot. Mag., Tokyo, XI. (1897) p. 413.

Orchis Fauriei Finet in Journ. d. Bot. XII. (1898) p. 340, tab. 5, fig. A–K. et in Bull. Bot. Soc. de France, XLVII. (1900) p. 276.

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (Herb. Sc. Coll. Imp. Univ. Tokyo, June 1879); Prov. SAGAMI: Mt. Futago in Hakone (*S. Ōkubo!* herb. ibid. June 1884); Prov. ECHIGO: Mt. Shimidzu-tōge (*R. Yatabe* and *S. Ōkubo!* herb. ibid. July 19, 1886); Prov. RIKUCHŪ: Mt. Kurikoma (*T. Makino!* Aug. 1890).

Platanthera Inumæ Makino in herb. 1895.

Habenaria Inumæ Makino Ill. Fl. Jap. I. n. 9, (1891) p. 1, tab. 53.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* 1885); Prov. IYO: Mt. Nakatsu (*K. Watanabe!*); Prov. MUSASHI: Mt. Takao (*T. Makino!* July 15, 1890; *K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 16, 1890); Prov. HYŪGA: Mt. Kirishima (*R. Yatabe* and *J. Matsumura!* herb. ibid. Aug. 3, 1882); Prov. HITACHI: Mt. Tsukuba (*C. Ōwatari!* herb. ibid. Sept. 2, 1895).

Cœloglossum flagelliferum Maxim. in litt.; Makino Ill. Fl. Jap. I. no. 3, (1889) tab. 17.

Terrestrial; tubers 2, ovoid or elliptical; roots few, fibrous, thickish. Stem erect, 20–45 cm. high including the raceme. Leaves: the lower 3 or 4 erect-patent, more or less approximate, lanceolate, shortly acuminate, the largest one about 8 cm. long, 2 cm. or more wide; the upper ones distant, erect, much reduced in size and bract-like. Raceme spike-like, angustate, laxly or rather laxly flowered, shorter than the stem; bracts ovate, attenuate-acuminate, usually shorter than the ovary. Flowers small, erect, greenish. Perianth semi-patent, obtuse, 1-nerved. Outer perianth: the upper one ovato-lanceolate; the lateral ones oblong-lanceolate, a little longer than the upper one, scarcely oblique in form. Inner perianth ovate, somewhat oblique in form, partly adherent to the labellum at the base, very slightly shorter than the outer lateral perianth. Labellum adherent to the gynostemium at base, geniculate and with a transverse arcuate callose lamella below; lamina 3-lobed, the midlobe oblong-lanceolate, obtuse, entire, thickish, $1\frac{1}{2}$ – $2\frac{1}{2}$ mm. long; lateral lobes patent, flagellate-filiform, longer than the midlobe, about 6–7 mm. long; calcar clavate, descending, about 3 mm. long, retusely bifid at the end. Gynostemium very short; anther rounded-ovate, with apart and linear-oblong cells; rostellum erect, ovate; stigmas slightly curved. Ovary cylindrical-oblong, nearly sessile, 4–8 mm. long.

Habenaria flagellifera Makino Notes on Jap. Pl. in Bot. Mag., Tokyo VI. (1892) p. 48.

Hab. Prov. TOSA: Tokano (*T. Makino!* 1885), Susaki (*T. Yoshinaga!* 1887).

Aspidium falcatum Sw. var. **macrophyllum** Makino var. nov.

Fronde 30–58 cm. long, 17–23 cm. wide, longer than the stipe; pinnæ

ample, membranaceous, 2-8 on each side of the slender rachis, very shortly petiolulate, or subsessile, falcato-ovate, acuminate, rounded or obtuse-rounded at the base, more or less serrate above, 9-17 cm. long, 5-9 cm. broad, often trilobed and often attaining about 13 cm. broad in the odd one, light green, subopaque above; lateral veins visible superficially; veinlets invisible, but visible by transmitted light. Sori dispersed.

Hab. Prov. KII: Mt. Mikoshi-tōge (*M. Miyoshi!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 22, 1887); Prov. Tosa: Mt. Yokogura (*T. Makino!* 1889), Beppu-mura (*T. Makino!* Nov. 1892), Mt. Sembon-no-tō in Aki-gōri (*I. Doi!* Aug. 15, 1901).

There have been observed four varieties in Japan, namely *a. typicum*, *β. Fortunei* Baker, *γ. caryotideum* Baker, and present one.

SEMIAQUILEGIA Makino gen. nov. = *Isopyrum partim* Auct. (*Helleboreae—Ranunculaceae.*)

Flowers regular. Sepals 5, petaloid, imbricate, campanulately semipatent, deciduous. Petals 5, alternate with sepals, erect, imbricate, smaller than sepals, sessile, tubular below, produced into a gibbose calcar at the base which projects outwards beyond them between the sepals. Stamens 9-10, a few inner ones often becoming into staminodes. Pistils 3-4, or rarely 5, sessile, free, pluriovulate. Follicles 3-4, or rarely 5, divaricate, dehiscent, plurispermous. Seeds albuminous; embryo very minute; testa crustaceous, black, granulato-rugulose.

Herbs gracile, erect; roots tuberous, rhizome-like, perennial. Leaves simply ternatisected; radical ones tufted; cauline ones alternate. Stem erect, herbaceous, gracile, laxly ramose, leafy. Flower minute, drooping, pedicellate; sepals white, shaded with purple colour; petals yellowish above.

This is to be placed between two genera of *Aquilegia* and *Isopyrum*.

Semiaquilegia adoxoides (DC.) Makino. nom. nov.

Isopyrum adoxoides DC. Syst. I. (1818) p. 324, et Prodr. I. (1824) p. 48; Spreng. Syst. Veg. II. (1828) p. 470; Miq. Ann. Mus. Bot. Lugd.-Bat. III. (1867) p. 7, et Prol. Fl. Jap. p. 195; Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 11; Maxim. in Bull. Soc. Nat. Mosc. (1879) p. 3, et in Mém. Biol. XI. p. 630, (1883); Hance in Journ. Bot. (1880) p. 257; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. (1886-88) p. 18; Huth in Bull. Herb. Boiss. V. (1897) p. 1088; Prantl in Engl. et Prantl Nat. Pflanzenfam. III. 2, p. 58; Diels in Engler's Bot. Jahrb. XXIX. (1901) p. 325.

Isopyrum capnoides Fisch. in litt. ex DC. Prodr. I. p. 48.

Isopyrum japonicum Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abhandl. Akad. Muench. IV. 2, (1842) p. 181; Walp. Ann. Bot. Syst. I. (1849) p. 954; A. Gray in Perry's Exped. Jap. (1856) p. 306, et Bot. Jap. in Mem. Amer. Acad. Art et Sc. n. s. VI. (1859) p. 379.

Root tuberous, ovoid to oblong, vertical or oblique, often lengthened and subflexuous and sometimes forked or ramose above, smooth, or uneven with annular wrinkles or small protuberances, brownish-black, thick, solid, white internally, attaining about 15 mm. in diameter, with fibrous roots towards the end; fibrous roots delicate, many, often dense, dark-brown, with very fine rootlets. Radical leaves tufted, numerous, long-petioled, simply trisected, reniform-orbicular in outline, 1-3½ cm. long, 2-4½ cm. broad; segments shortly petiolulate, flabellately 3-parted with closed sinuses, subrhomboid-rounded, 6-26 mm. long, very broadly cuneate at the base in the middle segment, but truncato-cuneate in the lateral ones, lobes obovato-cuneate, commonly tri-bi-lobulate into rounded ovato-rounded or elliptical and very minutely mucronate teeth, green and often albo-variegated above, glaucous and often shaded with purple; main-nerves flabellate, delicate; veinlets loosely anastomosing; pedicel 3-12 mm. long, gracile, thinly pubescent with delicate patent hairs as is the petiole; petiole slender, gracile, terete, 4-13 cm. long, vagina ovate, oval-ovate, ovate-deltoid, thinly membranaceous, entire, with 3 main nerves in the middle portion, about 5-10 mm. long. Cauline leaves distantly alternate, shortly petiolate in the lower ones, but sessile in the upper ones, similar to the radical one in their forms, divisions and venations, but the upper ones simpler and smaller, green, often shaded with purple, glaucous beneath; vagina short, ½-4 mm. long, ovato-square or transversely obovate, obovate, membranaceous towards the margin, the upper edges often minutely erosulate. Stems 8-40 cm. high, one to several, erect, much exceeding the radical leaves in height, gracile, subfistulose, very laxly ramose with erect-patent branches, terete, often subangular, thinly pubescent with delicate patent subglandular white hairs (which are enlarged towards the base), the lower portion free from the leaves, green, often purpurascens, herbaceous. Flowers minute, terminating the elongated filiform thin-pubescent pedicel, nodding, 4-6½ mm. long; receptacle thick, depressed. Sepals 5, campanulately semipatent, imbricated in bud, petaloid, oblong-lanceolate, obtuse, sometimes acutish, entire, shortly attenuated as to form a broad unguis at the base, membranaceous, laxly nervate, white, shaded with purple externally, 4-6½ mm. long. Petals 5, alternate with and shorter than sepals, sessile, imbricated erect, spatulately obovato-cuneate, truncate

at the apex, membranaceous, yellowish above, loosely nerved, 3-3½ mm. long, 1½ mm. wide, suddenly incurved and thicker in texture at the base, compressed-infundibuliform below, with the bifid inner edge about one-third as long as the outer edge, shortly gibboso-calcarate immediately above the very base externally, the calcar thick-walled and protruding outwards beyond them between the sepals. Stamens 9-14, erect, included, slightly longer than the petals; filaments subulato-filiform, glabrous, one-nerved; anther minute, ovoid-orbicular or ovoid-elliptical, light yellow, basifixed, rounded at top, hardly bifid at the base, 2-celled, laterally dehiscing longitudinally; pollen light yellow, oblong, smooth, longitudinally 3-furrowed. Staminodes often present, 1-4 in number, about half as long as stamen, broadly linear, usually attenuated above into an obtuse tip, thinly membranaceous, enerved or 1-nerved. Pistils 3-4, or rarely 5, erect, about equalling the stamens in height; ovaries sessile, free, lanceolato-cylindrical, acute into the style, greenish, glabrous, 1-celled, thinly walled, with about 10-14-ovules in 2 rows; ovules minute, obovoid, smooth, sessile, anatropous; style erect, gracile, shorter than the ovary; stigma minute, obliquely terminal, punctato-introrse. Follicles 3-4 or rarely 5, stellately divaricate, subfalcato-oblong-lanceolate, acute to the persistent style, sessile, free, laterally compressed, straight or a little arcuate, glabrous, membranaceous, with delicate oblique veins, green, dorsal margin delicately subcarinate, 9-10 mm. long, nearly 3 mm. wide, dehiscing throughout the ventral suture, 10-14-seeded. Seeds small, subfusiform-obovate, a little oblique in form, sessile, 1½ mm. long; testa crustaceous, black, minutely granulato-rugulose; albumen copious, dense; embryo very minute.

Hab. Prov. TOSA: Sakawa (*T. Makino*!); Prov. MUSASHI: Tokyo (*R. Yatabe* and *J. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, April 18, 1878; *T. Makino*! April 1893, April 1896, April 1900), Komaba (*T. Makino*! May (1902); Prov. SAGAMI: Yokosuka (Herb.! *ibid.* Nov. 24, 1880); Prov. IDZU: Shimotaga (*S. Okubo*! herb. *ibid.* June 3, 1883), Okadamura in Isl. Ōshima (*S. Okubo*! herb. *ibid.* April 17, 1887); Prov. HIZEN; Nagasaki (Herb.! *ibid.* May 12, 1879); Prov. AWA in Shikoku: Yamashirodani-mura (*R. Yatabe*! herb. *ibid.* July 1888); Prov. SŪ: Ōchi-mura (*D. Nikai*! herb. *ibid.* April 20, 1892); Prov. ŌMI: Hikone (*T. Makino*! April 1902).

Common in Japan.

Viola (Nomimium) **violacea** Makino Illustr. Fl. Jap. I. no. 17, (1891) p. 1, tab. 67.

Viola Bisseti var.? Maxim. in litt.

Acaulescent; roots long, with rootlets. Leaves tufted, long-petioled, ovato-lanceolate, or deltoid-lanceolate, but ovate in the inferior ones, acute or obtuse, or attenuated above, auriculato-cordate with the obtuse bottom at the base, depressed crenate, glabrous or thinly piloso-pubescent and often albo-variegated along the nerves above, purple beneath, 2-5 cm. long, 1-2 cm. wide, but attaining about 8 cm. broad after anthesis; lateral veins 4-5, very loose; petiole narrow, exalate, usually longer than the blade, glabrous; stipules subulato-lanceolate or subulato-linear, adnate to the petiole at the base, loosely glandular-subciliated-margined, membranaceous. Peduncles 1 to several, exceeding the leaves, slender, glabrous; bracts 2, placed at the middle of peduncle, opposite or subopposite, linear, obtuse, 1-nerved, glandular-denticulated at the base. Flowers rose-violet, about 1-1 $\frac{3}{4}$ cm. across. Sepals ovato-lanceolate, acute, glabrous, 3-nerved, 4-7 $\frac{1}{2}$ mm. long; basal auricles truncato-subsemiorbicular, larger in those of the lower 2 sepals. Petals obovate to obovato-oblong, rounded or retuse at apex, beardless, 9-13 mm. long; calcar narrow, straight or subarcuate, obtuse, longer than sepals, about 5-7 mm. long. Projected portion of the connective fulvous, rounded-ovate, obtuse, membranaceous; anther-appendages filiform-linear, longer than the half of calcar. Ovary ovoidal, glabrous; style longer than the ovary, enlarged above, geniculate at the base; stigma deltoid, the beak very short. Capsule glabrous, longer than the persistent calyx; valves broadly lanceolate, acute, hard, about 7-8 mm. long. Fl. April.

Hab. Prov. Tosa: Sakawa (*T. Makino!* 1884, 1885), Nanokawa (*K. Watanabe!* May 9, 1886; *Id!* herb. Sc. Coll. Imp. Univ. Tokyo, April 18, 1888), Ushioe-yama (*R. Yatabe!* herb. *ibid.* Aug. 1, 1888); Prov. Kii: Mt. Kōya (*M. Miyoshi!* herb. *ibid.* Aug. 25, 1887); Prov. Awa in Shikoku: Shimomyō-mura (*R. Yatabe!* herb. *ibid.* July 25, 1888); Prov. YAMATO: Kasuga-yama (*J. Matsumura* and *S. Okubo!* herb. *ibid.* July 15, 1883); Prov. IZU: Mt. Amagi (*S. Okubo!* herb. *ibid.* June 12, 1883); Prov. HYŪGA: Mt. Kirishima (*R. Yatabe* and *J. Matsumura!* herb. *ibid.* Aug. 3, 1882); Prov. ECHIGO: Ideyu (*R. Yatabe* and *S. Okubo!* herb. *ibid.* Aug. 1, 1887); Prov. SŪŌ: Ōuchi-mura (*D. Nikai!* herb. *ibid.* April 17, 1892); Prov. Ōmi: Mt. Suribari-tōge (*T. Makino!* April 1892).

This species is common on mountains, hills, and forests in the middle and southern Japan.

Viola (*Nomimium*) **Yatabei** Makino sp. nov.

Viola phalacrocarpa var. *pallida* Yatabe, ex parte, in Bot. Mag., Tokyo, VI. (1892) p. 102.

Viola flaccida Makino in Bot. Mag., Tokyo, XIII. (1899) p. 242 (nomen).

Acaulescent, flaccid; roots fibrous; innovations subterranean, slender, root-like. Leaves few to several, erect-patulous or spreading, ovate, obtuse, auriculate-cordate with rounded lobes, shortly decurrent to the petiole, crenato-serrate, membranaceous, green, about $2\frac{1}{2}$ – $7\frac{1}{2}$ cm. long, 2–5 cm. broad in flower, but attaining about 13 cm. long, $8\frac{1}{2}$ cm. wide after anthesis, thinly pilose above and ciliated, hispid-pilose along nerves beneath; veins 5–6 on each side, lax; petiole shorter or longer than the blade, pilose, attaining about 20 cm. in length after anthesis; stipules about 12–24 mm. long, thin, laxly papillose-margined, the lower half or more adnate to the petiole, the free portion subulato-lanceolate to broadly linear, acuminate. Peduncles few, shorter than the leaves, pilose; bracts 2, placed at the inframedium, opposite, or subopposite, erect, angustato-linear, obtuse-tipped, very laxly papillose-glandular on margin, 10–17 mm. long. Flower 20–28 mm. long, white. Sepals lanceolate, or broadly lanceolate, acute or obtuse, with 3 main nerves, viridescens, thinly pubescent dorsally, 7–10 mm. long excepting the basal auricles; auricles pilose, unequally pauci-laciniate-dentate in those of the upper sepal (attaining nearly 5 mm. in length) and the lower 2 sepals (which are larger and 3–5 mm. long), but those of the lateral 2 sepals smaller simple and deltoid-subulate. Petals 14–17 mm. long, elliptical-obovate, rounded and minutely erosulate at the apex, but oblong and emarginate and purple-striped in the lower one, the lateral ones bearded with white hairs in throat internally; calcar horizontal, broadly oblong, rounded at apex, usually shorter than the sepals, 6–8 mm. long, 4 – $4\frac{1}{2}$ mm. wide. Connective-tip broadly ovate, obtuse; anther-appendages broadly linear, hardly arcuate at the apex, obtuse, two-thirds or three-fourths as long as the calcar. Ovary ovoid, glabrous; style about equal to the ovary in length, clavate, glabrous; stigma cuneato-obovate, with an obtuse and very short beak. Capsule ovato-cylindrical, acute, glabrous, 11–13 mm. long; valves lanceolate, or broadly lanceolate. Seed brown. Fl. April.

Hab. Prov. MUSASHI: Shimura (*T. Makino!* June 1888, May 1, 1891; *S. Ikeno!* April 1888); Adzusawa (*T. Makino!* April 14, 1894, April 1895); Tokyo (*B. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, April 24, 1878); Near Tokyo (*Herb. ibid.* April

24, 1879), Ōzi (*R. Yatabe* and *J. Matsumura!* herb. *ibid.* April 24, 1878), Chichibu (*R. Yatabe* and *J. Matsumura!* herb. *ibid.* April 1878), Near Iino in Chichibu (*T. Makino!* April 3, 1895), Mt. Takao (Herb. *ibid.* April 30, 1899), Mt. Mitake (*Y. Yabe!* herb. *ibid.* May 15, 1900).

This species is very closely allied to the Korean *Viola albida* Palib. *Consp. Fl. Koreæ* I. p. 30, tab. 2, fig. 2.

***Viola* (Nomimium) *Miyabei* Makino sp. nov.**

Viola phalacrocarpa var. *major* Maxim. ex K. Miyabe.

Viola phalacrocarpa var. *pallida* Yatabe, ex parte, in *Bot. Mag.*, Tokyo, VI. (1892) p. 102.

Acaulescent; rhizome short, erect, sometimes thick, with stout roots. Leaves few, long-petioled, ovate, or subdeltoid-ovate, obtuse, often slightly attenuated above, cordate with an open sinus, depressed-crenate, membranaceous, glabrous above, piloso-pubescent on the nerves beneath, green, sometimes with purple in the middle, 4-7½ cm. long, 2½-4½ cm. broad; veins very loose, arcuate; petiole elongated, usually longer than the blade, pilose, sometimes very narrowly winged above, 4-14 cm. long; stipules thinly membranaceous, subulato-lanceolate to linear, sharply acuminate, adnate to the petiole with the lower portion, loosely glanduloso-denticulate, the free portion about 4-9 mm. long. Flowers large, 2-3 cm. across, rose-purplish; peduncle shorter than the leaves, few, sparsely pilose; bracts in the middle of the peduncle, opposite or subopposite, linear, erect, 4-7 mm. long. Sepals lanceolate, acutish or subobtuse, thin, green, with 3 main nerves and loose veinlets, 8-11 mm. long; the basal auricles glabrous, entire, depressed-semiorbicular, but ovato-semiorbicular in those of the lateral 2 sepals. Petals obovate or broadly obovate, emarginate or retuse or rounded at apex, shortly cuneately narrowed below, about 15-20 mm. long, 8-14 mm. wide, the lateral ones always bearded; calcar shorter than the sepals, oblong-cylindrical, rounded at the end, 5½-8 mm. long, 2-2½ mm. broad. Connective-tip broadly ovate, obtuse; anther-appendages linear-filiform, obtuse, 4-5½ mm. long. Ovary ovate, glabrous; style scarcely longer than the ovary, glabrous, enlarged above, geniculate at the base; stigma dilated into a deltoid and subbilobed face, the beak very short.

Hab. Prov. SHIMOTSUKE: Nikko (Herb. ! Sc. Coll. Imp. Univ. Tokyo, May 1887); Prov. ISHIKARI in Hokkaidō: Omagari in Tsukisappu (*K.*

Miyabe! herb. *ibid.* June 9, 1884), Between Sapporo and Chitose (*Y. Tokubuchi!* herb. *ibid.* June 13, 1889).

This species is found in the middle and northern Japan. It is distinct from *Viola phulacrocarpa* Maxim. (= *V. Conilii* Franch. et Sav.).

Viola (Nomimium) **multifida** (Franch. et Sav.) Makino, non Mill. nec Willd.

Viola incisa var. *multifida* Franch. et Sav. Enum. Pl. Jap. II. p. 284.

Acaulescent. Leaves often many, ovate or broadly ovate, cordate with subinvolute basal margins, subpalmato-pinnately deep-partite with closed or narrow sinuses; segments few on each side, ovate to lanceolate, acutish, contracted at the base in the lower ones, pauci-incisobulbate, the lobules and teeth ovate to ovato-lanceolate and obtuse or acutish pointed, minutely ciliated, thinly pubescent above, pilose on nerves beneath, attaining about 8 cm. long, 5½ cm. wide after anthesis, palmato-penninerved; petiole usually longer than the blade, very narrowly marginate above, piloso-pubescent, green shaded with purple below as is the peduncle, attaining about 15 cm. long after anthesis; stipules adnate below, subulate-linear, acuminate, loosely glanduloso-ciliated. Peduncle thinly piloso-pubescent and then glabrate; bracts opposite, situated below the middle portion or at the lower portion of peduncle, erect, subulato-linear, acuminate, glanduloso-denticulate at base, 10–16 mm. long. Flower pale lilac. Sepals ovato-lanceolate, acute, trinerved, 6–7 mm. long exclusive of the basal auricles; basal auricles of the lower 2 sepals longer and obliquely truncate and eroso-incised.

Hab. Prov. MUSASHI: Tokyo, cult. (*S. Furukawa!* 1901; *T. Makino!* May 1902).

The leaves of this species resemble those of the North-American *Viola palmata* Linn., but are more dissected and lobes more tapering.

Viola (Nomimium) **Savatieri** Makino nom. nov.

Viola incisa var. *acuminata* Franch. et Savat. Enum. Pl. Jap. I. p. 41, et II. p. 248; Maxim. in Mém. Biol. IX. p. 720.

Acaulescent. Leaves deltoid-lanceolate, subcordate or truncate at the base, acuminate with an obtuse tip, irregularly inciso-serrate or irregularly lobulato-serrate with obtuse-tipped teeth, thinly puberulent above, glabrous or thinly puberulent along nerves beneath, minutely ciliated, penninerved,

about 3 cm. long, $1\frac{1}{2}$ - $1\frac{2}{3}$ cm. wide, but attaining about 9 cm. long, 4 cm. wide after anthesis; veins 4-5 on each side, loose, ascending; petiole narrowly winged above, glabrate above or pubescent, green above, purple below; stipules adnate below, the free portion subulate-linear, acuminate, loosely and minutely glanduloso-ciliated. Peduncle equalling or slightly exceeding the leaves in height, glabrous or pubescent below; bracts 2, erect, opposite or subopposite, angustato-linear, acute, thin, very laxly glanduloso-ciliated at the base, 7-12 mm. long. Flower about $1\frac{1}{4}$ cm. across, violet. Sepals lanceolate, acute, entire, glabrous, with 3 main nerves and laxly anastomosing veinlets, 6-8 mm. long; the basal auricles rectangular or subsemiorbicular, truncate or subtruncate and pauci-dentate or scarcely crenulate at the apex, about $2\frac{1}{2}$ -3 mm. long, but that of the superior sepal deltoid-lanceolate, and those of the lateral sepals minute and deltoid. Petals narrowly oblong, slightly attenuated below, rounded-subretuse at the apex, the lateral ones slightly bearded, about 13-14 mm. long, $5\frac{1}{2}$ -6 mm. broad; calcar scarcely shorter than the sepals, oblong, rounded at the end, straight, about 6 mm. long. Connective-tip oval-orbicular; anther-appendages more or less arcuate, broadly linear below but narrowly attenuated above, obtuse-tipped, three-fourths as long as the calcar. Ovary ovate, acute, glabrous; style equalling the ovary in length, gradually enlarged above, glabrous, geniculated at the base; stigma narrowly obovate, beaked. Fl. April.

Hab. Prov. MUSASHI: Mt. Mitsumine (*A. Yasuda!* April 4, 1895), Tokyo, cult. (*S. Furukawa!* 1901; *T. Makino!* May 1902).

The apex and teeth of leaves of the figure in Inuma's *Sōmoku-Dzuzetsu*, XVII. fol. 57 recto, are too sharp.

Viola Patrini* DC. var. *minor Makino in *Bot. Mag.*, Tokyo, VI. (1892) p. 50.

Smaller. Leaves deltoid-lanceolate, acute, truncato-subcordate at the base, crenato-serrate but depressed-crenate above, thin, glabrous, attaining about 6 cm. long, 3 cm. broad after anthesis; petiole very narrow, exalate, or very narrowly alate above, longer than the blade. Peduncles often many, longer than or about equal to the leaves, gracile, filiform. Flowers smaller, 10-12 mm. across, deep violet. Petals usually narrower. Capsule about 7 mm. long.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1885, 1889); Prov. IYO: Uwazima (*Z. Umemura!* 1896).

Viola (Nomimium) **Boissieuana** Makino sp. nov.

Viola Selkirkii Maxim. in litt. 1888; Makino in Bot. Mag., Tokyo, II. p. 252, non Pursh.

Acaulescent, pygmaeous. Roots long, with fine rootlets. Rhizome erect, short or slender, inarticulated, with a few small membranaceous scales at the base. Leaves few to several, or sometimes many, erect, or erect-patent, deltoid-ovate or deltoidly ovate-rounded, often lunate-ovate after anthesis, obtuse or acutish, auriculate-cordate with a deep sinus and often connivent lobes at the base, crenate-serrate with more or less concave-margined teeth, membranaceous, glabrous, or sparsely pubescent with white fine hairs above, $1-3\frac{1}{3}$ cm. long, $1-2\frac{1}{2}$ cm. broad; veins loose, 3-4 on each side; petiole gracile, exalate, glabrous, usually longer than the blade, $1\frac{1}{4}-6\frac{1}{2}$ cm. long; stipules subulate or linear, adnate to the petiole at the base, thin, entire or pauci-glandular-suberrulate. Peduncles erect, about 1-7, exceeding the leaves in height, but shorter than leaves in those of the cleistogamous flowers after the normal flowers, slender, glabrous, bracteate in the middle or below it, 2-10 cm. long; bracteoles 2, approximate, linear, 3-5 mm. long. Flowers as in those of *V. Maximowicziana* Makino in size, form, and colour, but the sepals glabrous and not reflexed, and the lateral ones equalling the others in size, the petals sometimes broader, the stigma subdeltoid with a short beak. Capsules as also in those of *V. Maximowicziana* Makino. Fl. April-June.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* 1884, May 1893), Nagasaka-mura (*K. Watanabe!* April 22, 1888), Nanokawa (*K. Watanabe!* May 6, 1889), Ushioe-yama in Kōchi (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1, 1888); Prov. IYO: Mt. Ishidzuchi (*R. Yatabe!* herb. ibid. Aug. 9, 1888).

Allied to *Viola Sieboldi* Maxim. I have named it in honour of Dr. H. de Boissieu, who made a valuable study on Japanese Violets.

Viola Sieboldi Maxim. in Mém. Biol. IX. p. 729; Franch. et Sav. Enum. Pl. Jap. II. p. 647; Makino in Bot. Mag., Tokyo, II. p. 252.

Viola Selkirkii Miq. Prol. Fl. Jap. p. 85, pro parte, ex Maxim. l. c.

? *Viola variegata* γ. *ircutiana* Franch. et Sav. l. c. p. 286, excl. syn.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1885, May 1889), Mine in Ogawa-mura (*T. Makino!* May 21, 1889), Moriyama-mura (*K. Watanabe!*), Nanokawa (*K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, April 17,

1890), Tadzikawa (*T. Makino!* May 1893); Prov. IITACHI: Mt. Tsukuba (*T. Makino!* April 5, 1894, May 1897, May 1900; *C. Ōwatari!* herb. ibid. April 15, 1895); Prov. ISE: Bodaisen in Watarai-gōri (*Z. Umemura!*).

Viola (*Nominium*) **Maximowicziana** Makino sp. nov.

Viola Selkirkii forma major Maxim. in litt. 1888; Makino in Bot. Mag., Tokyo, II. p. 253.

Viola serpens Yatabe in herb. Sc. Coll. Imp. Univ. Tokyo, et in Bot. Mag., Tokyo, VI. p. 130, non Wall.

Acaulescent, flaccid. Roots slender, with delicate rootlets. Rhizome erect, often elongate, inarticulated with a few membranaceous scales (about 2–6 mm. in length) at the base. Leaves several, or sometimes many, spreading from the top of the rhizome, elliptical or elliptical-ovate, but ovato-rounded in the inferior ones, obtuse, cordate at the base, with the connivent lobes when recent, crenato-serrate, thin, flaccid-herbaceous, sparsely pilose with white hairs, darkish-green and often albo-variegated along nerves above, often purpureo-violaceous beneath, 1–7 cm. long, $\frac{4}{5}$ – $4\frac{2}{3}$ cm. wide; veins about 3–6 on each side, loose, ascending, arcuate; veinlets loose and inconspicuous; petiole exalate, pilose with patent white hairs or glabrous, shorter or longer than the blade; stipules linear or subulato-lanceolate, acuminate, membranaceous, adnate to the petiole with the basal portion, minutely and laxly glanduloso-subciliated. Peduncles slender, longer than the leaves, but shorter in those of the cleistogamous flowers after the normal flowers, glabrous or pilosulate with patent white hairs, bracteate above the middle; bracteoles 2, approximate or more or less remote, linear, $2\frac{1}{2}$ –7 mm. long, glabrous or pilosulate. Flowers white, about 10–15 mm. across. Sepals reflexed, oblong-lanceolate or ovato-oblong, acute or obtuse, 3–5 mm. long, green, glabrous, or pilose with white hairs dorsally, the lateral 2 smaller, the main nerves usually 3; the basal auricles very short, depressed- or truncato-semiorbicular, or some of them subdeltoid. Petals narrowly oblong, or oblong-lanceolate, a little attenuated below, obtuse, 7–10 mm. long, the lateral ones slightly bearded, the lower one shorter concave and violet-striped; calcar short, broadly elliptical, a little longer than the sepals. Connective-tip ovate; appendages falcate, about 2– $2\frac{1}{2}$ mm. long. Ovary ovate, glabrous; style narrow, enlarged above; stigma dilated into broadly orbicular or subdeltoid face, the beak minute and short. Capsule elliptical, obtuse or acute, glabrous, 4–6 mm. long. Seeds obovoid-globose, smooth. Fl. April-May.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* 1885, May 6, 1889, June 1893; *T. Yoshinaga!* May 8, 1895), Nanokawa (*K. Watanabe!*) Mochii (*K. Watanabe!* May 13, 1888), Mt. Imano in Hata-gōri (*T. Makino!* Aug. 7, 1887), Mt. Tebako (*T. Makino!* Aug. 1885); Prov. MUSASHI: Mt. Takao (Herb. Sc. Coll. Imp. Univ. Tokyo, April 30, 1899; *T. Makino!* May 1902); Prov. IDZU: Mt. Amagi (*S. Okubo!* June 9, 1883); Prov. HITACHI: Mt. Tsukuba (*T. Makino!* May 1900).

This differs apparently from *Viola Selkirkii* Pursh; and R. Yatabe erroneously identified it with *V. serpens* Wall. which have not yet been found in Japan.

***Viola* (Nomimum) *Tokubuchiana* Makino sp. nov.**

Acaulescent, small; roots slender, with delicate rootlets. Rhizome short, erect; vaginæ of the neck few, oval-ovate to oblong-ovate, often tridentate at the apex, thinly membranaceous, pale, loosely glanduloso-ciliated on margin, about 5–11 mm. long. Leaves few to many, erect or erect patulous, ovate, deltoid-ovate, or narrowly subdeltoid-ovate, sometimes subovate-lanceolate, shortly acuminate with an acute or subobtuse tip, deeply auricled with connivent ovate lobes, crenato-serrate, 2–5 cm. long, $1\frac{3}{4}$ – $3\frac{1}{4}$ cm. wide, membranaceous, flaccid, thinly piloso-pubescent and albo-variegated along the nerves above, glabrous beneath; petiole gracile, exalate, usually longer than the blade, glabrous, or slightly piloso-pubescent above, 2– $7\frac{1}{2}$ cm. long; stipules viridescens, subulate to subulato-linear, acuminate, thinly membranaceous, loosely glanduloso-ciliated-margined, adnate more than the half below, but the superior ones adnate at the base. Peduncles equal to or longer than the leaves, gracile, glabrous, $2\frac{1}{2}$ –6 cm. long, bracteate below the middle; bracteoles 2, approximate, linear, loosely glanduloso-ciliated-margined below, about 5–8 mm. long. Flower 1– $1\frac{2}{3}$ cm. across, light lilac. Sepals lanceolate or broadly lanceolate, acuminate, thin, more or less hyaline-margined, with 3 main nerves, glabrous, but sometimes ciliated, 6–8 mm. long; basal auricles variable, entire and deltoid, or square and dentate, or oblong-rectangular and subdentate, or ovate-lanceolate, or short, or long, or glabrous, or ciliated. Petals obovato-oblong to narrowly oblong, attenuated at the base, obtuse or rounded at the apex, beardless or slightly bearded; calcar oblong, scarcely curved, about equalling the sepals in length, a little broader towards the rounded end, 5–8 mm. long, $2\frac{1}{2}$ –4 mm. broad. Connective-tip ovato-rounded, often with a minute subcuspidate tip; appendages broadly linear,

attenuated towards the end, 3-5 mm. long. Ovary ovate, acute, glabrous; style more or less enlarged above; stigma suborbicular, shortly beaked obliquely arising from the face towards the side. Capsule elliptical, obtuse, glabrous, about 6 mm. long.

Hab. Prov. MUSASHI: Mt. Mitsumine (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, April 30, 1878); Prov. SHIMOTSUKE: Near Chūzenji in Nikkō (*S. Okubo!* herb. ibid. May 17, 1887); Prov. ISHIKARI in Hokkaidō: Sapporo (*K. Miyabe!* herb. ibid. May 1880), Kamukotan (*K. Miyabe!* herb. ibid. Aug. 9, 1891).

Allied to *Viola Selkirkii* Pursh, but the leaves narrower above, more green when dried, and albo-variegated, and the petals sometimes bearded.

I have named it in honour of Mr. Yeizirō Tokubuchi.

Viola Selkirkii Pursh fide Goldie; DC. Prodr. I. p. 305; Hook. Fl. Bor.-Amer. I. p. 75; Torr. et Gray Fl. N. Amer. I. p. 137; Gray Man. Bot. ed. 5, p. 78, et Syn. Fl. N. Amer. I. p. 197; Id. Bot. Jap. p. 382; A. Wood Class-Book. Bot. p. 242; Walp. Repert. I. p. 217; Maxim. in Mém. Biol. IX. p. 730; Franch. Pl. David. I. p. 42; Miyabe Fl. Kuril. Isl. p. 219; Korsh. in Act. Hort. Petrop. XII. p. 310.

Viola kamtschatica Ging. in Linnæa I. p. 406; Ledeb. Fl. Ross. I. p. 245; Regel Pl. Radd. I. p. 227, tab. 6, fig. 7-15; Walp. l. c. II. p. 766.

Viola umbrosa Fries; Ledeb. Fl. Ross. I. p. 248; Maxim. Prim. Fl. Amur. p. 48; Fr. Schm. Reis. im Amur. u. Ins. Sachal. pp. 34, 115.

Viola borearis Weinm. in Linnæa X. p. 66; Walp. l. c. I. p. 214.

Viola imberbis Ledeb. Fl. Alt. I. p. 257, et Fl. Ross. I. p. 245; Walp. l. c. I. p. 214.

Viola salina Turcz.

Leaves rounded-ovate or ovate, obtuse or acutish, cordato-auricled with subconnivent lobes and a deep sinus at the base, thinly pubescent above, clearly green, not variegated. Flower light lilac. Calyx-appendages ciliated. Petal-calcar 7-8 mm. long, cylindrico-oblong.

Hab. Prov. NEMURO in Hokkaidō: Nemuro (*K. Miyabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 8, 1884); Prov. OSHIMA in Hokkaidō: Esashi (*K. Miyabe* and *Y. Tokubuchi!* herb. ibid. Aug. 4, 1890); Prov. UZEN: Mt. Yudono (*R. Yatabe* and *S. Ōkubo!* herb. ibid. July 22, 1887); Prov. IWASHIRO: Foot of Mt. Adatarō (*K. Nemoto!* May 1894), Nuruyu

(*K. Nemoto!* May 20, 1894); Prov. MITSU: Mt. Hakkōda (*T. Kinoshita!* comm. *K. Jō*, June 24, 1902).

***Viola* (Nomimium) *Umemuræ* Makino sp. nov.**

Acaulescent, small; roots few, divided from the end of the rhizome. Rhizome short, erect; neck-vaginæ few, oval or broadly ovate, tridentate at the apex, pale, thinly membranaceous. Leaves few, erect, ovato-rotund, or rotund, sometimes subreniform, obtuse or rounded at the apex, cordate with a rather wide or sometimes narrow sinus at the base, more or less regularly crenate, thin, more or less firm in texture, glabrate, but pulvereo-puberulent when young, green (and slightly pale-variegated along the nerves?) above, paler and sometimes purplish beneath, 15–25 mm. long, 14–21 mm. wide; petiole gracile, exalate, longer than the blade, 2–6 cm. long, pulvereo-puberulent; stipules small, subulato-lanceolate, acuminate, adnate more, or less than the half below, thinly membranaceous, laxly pauci-glanduloso-ciliated and ciliato-dentated on the margin, viridescens, about 5–6 mm. long. Peduncle exceeding the leaves in height, gracile, slender, pulvereo-puberulent, densely puberulous under the flower, $6\frac{1}{2}$ –9 cm. long, bracteate in the middle; bracteoles 2, approximate, linear, thin, pauci-glanduloso-subciliated on the basal margin, 3–5 mm. long. Flower small, about 1 cm. or more across, light violet. Sepals puberulent and very minutely ciliated, lanceolate or ovato-lanceolate, obtuse and thickish at the apex, thin, with 3 main nerves and loose delicate veinlets, 4–6 mm. long; basal auricles short, broadly semiorbicular or ovate or shortly oblong, entire, very minutely ciliated. Petals obovato-oblong, attenuated below, rounded at the apex, about 8–11 mm. long, the lateral ones densely bearded; calcar long, longer than the sepals, cylindrical, very obtuse at the end, straight or scarcely arcuate, 7–8 mm. long, 2–2 $\frac{1}{2}$ mm. broad. Connective-tip oval-ovate, obtuse; appendages filiform-linear, about 4 $\frac{1}{2}$ mm. long. Ovary broadly ovate, minutely puberulent; style longer than the ovary, enlarged above, geniculate at the base; stigma obliquely truncate, dilated, deltoid, slightly concave, with a short beak. Capsule oval, obtuse, glabrate, about 4–4 $\frac{1}{2}$ mm. long, equalling the persistent sepals in height.

Hab. Prov. IYO in Isl. Shikoku: Koshiore-yama (*Z. Umemura!* April 17, 1898).

This comes nearest to *Viola variegata* Fisch., but the shape of the stigma is different from it.

There are many specimens before me, collected from various localities of Japan, but I do not find *Viola variegata* Fisch. among them; *V. variegata* of various authors as a Japanese plant is probably not correct.

***Viola* (Nomimium) *shikokiana* Makino sp. nov.**

Acaulescent, stoloniferous; stolons hypogæous, elongate, filiform, with delicate roots. Leaves few, long-petioled, rounded-ovate or ovate, very shortly acuminate or acute with a callosobtuse or callosobtusish tip, deeply and subclosely auriculato-cordate at the base, crenato-serrate with a subcallose tip, membranaceous, glabrous above, pilosulate along the nerves beneath, yellowish-viridescent when dried, $1\frac{1}{2}$ –5 cm. long, $1\frac{1}{2}$ – $3\frac{2}{3}$ cm. broad; veins loose and arcuate upwards; petiole gracile, elongate, exalate, glabrous, $3\frac{1}{2}$ –16 cm. long; stipules free, minute, subulate, thinly membranaceous, glanduloso-margined, $1\frac{1}{2}$ – $3\frac{1}{2}$ mm. long. Peduncles 1–2, exceeding the leaves in height in flower, gracile, glabrous, bracteate in the middle; bracteoles 2, approximate, subulato-linear, glanduloso-margined, thin, 3 – $3\frac{1}{2}$ mm. long. Flower about $1\frac{2}{3}$ – $1\frac{1}{2}$ cm. across, white. Sepals lanceolate, or narrowly lanceolate, subcallosobtusish, green, hyaline-margined, glabrous, 3-nerved, 5 – $5\frac{1}{2}$ mm. long; basal auricles very short, but larger and deltoid with a produced end in those of the lower sepals. Petals narrowly oblong, somewhat attenuated below, rounded or subretuse at the apex, 9–11 mm. long, the lateral ones very slightly bearded, the lower one shorter and violet-striped; calcar short, shorter than the sepals, oval-rounded. Connective-tip ovato-rounded; appendages short and very broad, rounded-obtusish, oblique, thickly margined. Ovary ovate, glabrous; style scarcely longer than the ovary, enlarged above; stigma obovate, with a short beak. Capsule oblong, acute, glabrous. Fl. May.

Hab. Prov. TOSA in Isl. Shikoku: Mt. Torigata (*T. Makino!* May 22, 1889), Tadzikawa (*T. Makino!* May 5, 1893).

This comes near to *Viola blanda* Willd., which have not yet been found in Japan.

***Viola Keiskei* Miq.**

a. typica Makino.

Viola Keiskei Miq. Prol. Fl. Jap. p. 85; Eranch. et Sav. Enum. Pl.

Jap. I. p. 42, et II. p. 286; Maxim. in Mém. Biol. IX. p. 734; Boissieu in Bull. Soc. bot. France XLVII. p. 322.

Leaves glabrous. Petals white! as is β . *Okubo*, but darkish-yellow when dried, the lower one often violet-striped.

Hab. Prov. MUSASHI: Tokyo (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, April 18, 1879; *T. Makino!* April 1, 1890), Shimura (*T. Makino!* March 30, 1890); Prov. SHIMOOSA: Kōnodai (*R. Yatabe* and *J. Matsumura!* herb. ibid. April 18, 1879); Prov. IDZU: Near Hirai (*S. Okubo!* herb. ibid.).

β . **Okubo** Makino var. nov.

Leaves sparsely pubescent. Peduncles sometimes reddish.

Hab. Prov. TOSA: Nanokawa (*T. Makino!* Nov. 1884), Shimonanokawa (*K. Watanabe!* April 13, 1888), Mt. Yokogura (*T. Makino!* 1885; *T. Yoshinaga!* May 1895), Fumato (*T. Makino!* Nov. 1885), Mt. Kuishi (*T. Makino!* Oct. 7, 1892), Mt. Kuishi in Tadzikawa-mura (*T. Makino!* May 6, 1893); Prov. MUSASHI: Tokyo (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, April 14, 1880; *T. Makino!* April 1893, Sept. 13, 1893), Adzusawa (*T. Makino!* April 14, 1894), Nobitome (*T. Makino!* May 13, 1894), Mt. Mitake (*S. Matsuda!* herb. ibid. May 15, 1900), Mt. Takao (*T. Makino!* June 1902); Prov. SAGAMI: Mt. Ōyama (*S. Matsuda!* herb. ibid. May 18, 1900); Prov. AWA (=Bōshū): Mt. Kiyosumi (*S. Okubo!* herb. ibid. June 18, 1882); Prov. IDZU: Near Habu-mura in Isl. Ōshima (*S. Okubo!* herb. ibid. April 17, 1887).

Viola Bisseti Maxim. in Bull. Soc. Nat. Mosc. 1879, p. 5, et in litt. 1888; Makino in Bot. Mag., Tokyo, VI. p. 50.

Viola vaginata var. *angustifolia* Yatabe in herb. Sc. Coll. Imp. Univ. Tokyo, et in Bot. Mag., Tokyo, V. p. 319.

Acaulescent; roots long, often thickish, with delicate rootlets. Rhizome $1\frac{1}{2}$ -8 cm. long, attaining about 5 mm. across, erect, or oblique, or repent, sometimes branched, articulated, hard, the internode sometimes more or less elongated; vaginae of the neck chestnut-coloured, ovato-subulate or deltoid-subulate, acuminate, membranaceous, minutely glandulose-ciliated, $\frac{1}{2}$ - $1\frac{2}{3}$ cm. long. Leaves few, long-petioled, deltoid-lanceolate and shallowly cordate at the base and $2\frac{1}{2}$ -8 cm. long, $1\frac{1}{3}$ -3 cm. wide in flower, but after anthesis developing further and becoming subdeltoid-lanceolate or deltoidly broad-lanceolate prolonged-ovate in form, attaining

about 12 cm. long, and 5 cm. broad in size, deeply auriculate with ovate or elliptical lobes and the opened or the nearly connivent sinus at the base, depressingly crenato-serrate, acuminate with an obtuse or acutish tip, membranaceous, green and sometimes subalbovariegated along nerves above, paler beneath, subtilely thin-pubescent, with loose veins; petiole usually longer than the blade, $3\frac{1}{2}$ –27 cm. long, but 2–11 cm. long in flower, glabrous or thinly pubescent above; stipules free or aduate half below, subulate or subulato-linear, acuminate, membranaceous, chestnut-coloured, minutely glanduloso-ciliated, about 5–10 mm. long. Peduncles 1–2, erect, longer or shorter than leaves, $3\frac{1}{2}$ –13 cm. high, glabrous, bracteate in the middle or below it or rarely above it; bracteoles 2, approximate, subulate, acuminate, membranaceous, glandular-ciliated-margined below, 5–9 mm. long. Flowers large, $1\frac{2}{3}$ – $2\frac{1}{3}$ cm. across, light lilac. Sepals lanceolate, or ovato-lanceolate, obtuse, glabrous, 6–10 mm. long, the main nerves 3, often with delicate vienlets; basal auricles subtruncate and dentato-incised, the largest one about $3\frac{1}{2}$ mm. long. Petals obovate to oblong, rounded or retuse at the apex, 11–17 mm. long, beardless, the lowest one often a little broader; calcar short and wide, rounded, scrotiform, shorter than the sepals, 3–6 mm. long, 4–6 mm. broad. Connective-tip rounded-ovate; appendages short, ovato-falcate, obtuse, turned downwards, thicker towards the end, 2–3 mm. long. Ovary ovate, acute, glabrous; style equal to or longer than the ovary in length, gradually enlarged above, glabrous, slightly exerted from anthers; stigma obovate, concave, the beak produced. Capsule elliptical, acute, glabrous, 10–14 mm. long. Seeds obovoid, smooth, 2 mm. across.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* May 1893), Nanokawa (*T. Makino!* Nov. 1884; *K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, April 17, 1890); Prov. IITACHI: Mt. Tsukuba (*T. Makino!* April 5, 1894; *C. Ōwatori!* herb. ibid. April 12, 1895); Prov. MUSASHI: Mt. Takao (*T. Makino!* July 15, 1890), Mt. Kōsui-zan in Kaminariki-mura (*T. Makino!* April 1895), Kaminaguri-mura (*T. Makino!* April 5, 1895), Ōtaki in Chichibu (*R. Yatabe* and *J. Matsumura!* herb. ibid.), Mt. Ōdake (*J. Matsumura*, *Y. Yabe*, and *S. Matsuda!* herb. ibid. May 15, 1900); Prov. IZU: Mt. Amagi (*S. Ōkubo!* herb. ibid. June 12, 1883, April 4, 1887); Prov. ISE: Mt. Asama (*Z. Umemura!* May 7, 21, 1893).

This species is allied to *Viola vaginata* Maxim., but the shape of leaves is different.

***Viola* (Nomimum) *Matsumuræ* Makino sp. nov.**

Acaulescent; roots long, thickish. Rhizome erect, or oblique, articulated, hard, attaining about 4 cm. or more in length and about 4 mm. in diameter; vaginae of the neck ovate to ovato-subulate, acute or acuminate, membranaceous, minutely glanduloso-ciliated on the margin, shorter than the stipules, chestnut-coloured. Leaves 3-5, erect or ascending, long-petioled, subreniform-cordate, suddenly short-acuminate with an acute or acutish tip, auricled with large and oval lobes and a deep not wide sinus, crenato-serrate, thickly membranaceous, thinly pubescent above, pilosulo-pubescent beneath, concolorous, with loose veins, about 5-10 cm. long, 5-9½ cm. wide, but smaller in size and the basal lobes involute in flower; petiole longer than the blade, exalate, glabrous, but puberulent above, 9-16 cm. long, but 7-13 cm. long in flower; stipules pale, free, subulato-lanceolate, acuminate, very thinly membranaceous, very delicately loose-veined, minutely glanduloso-ciliated, 7-11 mm. long, 2-4 mm. wide. Peduncles erect, equalling the leaves in length in flower, but shorter in those of cleistogamous flowers, glabrous, bracteate above the middle; bracteoles 2, approximate, subulate, acuminate, thin, glanduloso-subciliated-margined below, 5-8 mm. long. Flower large, about 2-2½ cm. across, light lilac. Sepals oblong, obtuse, thin, glabrous, with 3 main nerves and loose delicate veinlets, 8-9 mm. long, 2½-3½ mm. broad; basal auricles subrectangular, truncate often with more or less sinuate margin, glabrous, about 2-3 mm. long, but smaller and obtuse narrow-oblong in the lateral ones. Petals obovate or broadly obovate, attenuated at the base, rounded or sometimes subretuse at the apex, about 15 mm. long, the lateral ones slightly bearded; calcar short, scrotiform, shorter than sepals, 3½-4 mm. long, 3½-5 mm. wide. Connective-tip broadly ovate, obtuse; appendages lunato-falcate, obtuse, curved downwards, 2½-3 mm. long. Ovary ovate, gradually acute; style slightly longer than the ovary; stigma obovato-deltoid, concave, the beak distinctly protruded. Capsule large, nutant, elliptical, acute, glabrous, about 1½-1¾ cm. long. Seeds obovoid, smooth, 3 mm. long, 2 mm. across.

Hab. Prov. MUSASHI: Chichibu (*R. Yatabe* and *J. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, April 23, 1878), Akiyama in Chichibu (*H. Sakurai*! herb. Imp. Mus. May 1884), Mt. Mitsumine in Chichibu (*T. Makino*! July 18, 1888); Prov. SHIMOTSUKE: Mt. Nikkō (*T. Makino*! Aug. 1884).

Very closely allied to *Viola vaginata* Maxim., but differs from it by its pale stipules, bearded petals, and entire or subsinuate-truncate-margined calyx-appendages. The leaves of *V. vaginata* Maxim. are entirely glabrous

on the upper surface, while those of my species are hairy on both surfaces.

Viola Raddeana Regel Pl. Radd. I. pp. 218, 256, tab. 7, fig. 1-5; Maxim. in Mém. Biol. IX. p. 747; Hemsl. in Journ. Linn. Soc. XXIII. p. 54; Korshinsky in Act. Hort. Petrop. XII. p. 311; Palib. Consp. Fl. Koreae I. p. 35.

Viola Raddeana var. *japonica* Makino in Bot. Mag., Tokyo, VI. p. 50.

Viola deltoidea Yatabe in herb. Sc. Coll. Imp. Univ. Tokyo, et in Bot. Mag., Tokyo, V. p. 318.

Caulicent. Rhizome short. Stems 1-6, erect, foliose, slender, flexuous, glabrous, dark-purple towards the base, the largest one attaining about $12\frac{1}{2}$ decim. in height and $3\frac{1}{2}$ mm. in diameter after anthesis. Leaves alternate, erect, petiolate, deltoid-lanceolate, acuminate with a callosa-acute tip, truncato-subcordate and subsagittate at the base, coarsely depressed-crenate, glabrous, thin, with loose veins, $3\frac{1}{2}$ -11 cm. long, 1-4 cm. across; petiole shorter than the blade, narrowly winged above, 2-5 cm. long; stipules foliaceous, free, erect, longer or shorter than the petiole, broadly linear, acute, one-laciniate-dentate and laxly obscurely crenato-serrate, thin, longitudinally 3-nerved, attaining about 6 cm. long. Peduncle axillary, shorter than the leaves, gracile, glabrous, about 6-10 cm. long, bracteate above the middle; bracteoles 2, approximate, subulato-linear, 4-7 mm. long. Flowers small, 9-12 mm, across, pale-ceruleo-violascent. Sepals lanceolate, acuminate, glabrous, 3-nerved, 5-8 mm. long; basal auricles very short, truncato-subdentate. Petals oblong, attenuated below, rounded-obtuse at the apex, 7-10 mm. long, the lateral ones beardless and furnished with a callus at the lower portion, the lower one shorter than the others, concave, violet-striped; calcar short, semi-orbicular, slightly protruded behind beyond the sepals, minutely pubescent within. Connective-tip ovato-deltoid, obtuse; appendages lamelliform, subrectangular, longitudinally adherent to nearly the whole length of the anther-cells, the outer margin thickish and parallel to the anther-cells. Ovary ovate, glabrous; style narrow, equalling the ovary in length; stigma capitato-deltoid, with a very short beak. Capsule oblong, acute, 10-13 mm. long, glabrous, with coriaceous carpels. Seeds obovoid, smooth, darkish when matured.

Hab. Prov. MUSASHI: Toda-hara (*T. Makino!* June 24, 1888, May

1891; *S. Ikeno!* herb. Sc. Coll. Imp. Univ. Tokyo, June 24, 1888); Prov. SHIMMOOSA: Mama (*T. Makino!* Aug. 7, 1894, June 23, 1895, May 1896, May 29, 1898).

This is allied to *Viola elatior* Fries (= *V. montana* DC.) and *V. stagnina* Kitaibel.

***Viola sylvestris* Kit. var. *ovato-oblonga* (Miq.)**

Viola sylvestris forma *ovato-oblonga* Miq. Prol. Fl. Jap. p. 86.

Viola sylvestris var. *montana* Yatabe in Bot. Mag., Tokyo, VI. (1892) p. 131, non *V. montana* Linn.

? *Viola Thibaudieri* Franch. et Sav. Enum. Pl. Jap. I. p. 43, et II. p. 290; Maxim. in Mém. Biol. IX. p. 756.

Caulicent. Rhizome erect, short. Stem few to several, erect or ascending, attaining about 30 cm. in height, puberulent or glabrous. Leaves glabrous or puberulent; radical ones broadly ovate, or ovate, obtuse or shortly acuminate, cordate, crenato-serrate, long-petioled; cauline ones narrowly ovate to narrowly lanceolate, acuminate with an acutish tip, cordate at the base, depressed-crenate, shortly petioled (being $\frac{1}{2}$ - $4\frac{1}{2}$ cm. in length), the longest one about $6\frac{1}{2}$ cm. long, $2\frac{1}{2}$ cm. wide; stipules membranaceous, deeply ciliato-pectinate, or laciniato-pinnatifid, equal to or shorter or longer than the petiole in the cauline leaves. Peduncle gracile, shorter or longer than the leaves, with 2 approximate subulato-linear bracteoles above the middle. Flower about $1\frac{1}{2}$ - $1\frac{2}{3}$ cm. across, violet. Sepals lanceolate, acuminate, glabrous, trinerved, 6-8 mm. long; the basal auricles short and truncato-rounded. Petals obovate or obovato-oblong, attenuated below, rounded at the apex, 11-15 mm. long, 6-8 mm. wide, the lateral ones slightly bearded; calcar oblong-cylindrical, straight, about as long as the sepals. Connective-tip ovato-orbicular; appendages linear, longer than the anther, 5 - $5\frac{1}{2}$ mm. long. Ovary conico-ovate, glabrous; style longer than the ovary, cylindrical; stigma not thick, with a short beak. Carpels coriaceous, glabrous, falcato-lanceolate, acute, concave, 6-11 mm. long.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1884, 1885), Mt. Yokogura (*T. Makino!*), Kōsuizi near Kōchi (*T. Makino!*), Koyatsuzi (*T. Makino!*); Prov. AWA (=ASHŪ): Ōtani-yama (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 19, 1888); Prov. IYO: Side of River Ishite (*T. Nagasawa!* April 12, 1891); Prov. SŪŌ: Ōuchi-mura (*D. Nikai!* herb. ibid. April 25, 1892); Prov. YAMATO: Kasuga-yama (*J. Matsumura!* herb. ibid. July

15, 1883); Prov. KII: Kimidera in Naka-gōri (*H. Sakurai!* herb. Imp. Mus. May 12, 1888); Prov. ISE: Mt. Asama (*Z. Umemura!* May 5, 1893); Prov. SHIMA: Funatsu (*Z. Umemura!* April 28, 1893).

R. Yatabe inappropriately identified it with *Viola montana* Linn. which is evidently a different species.

Viola rostrata Mühl.; Pursh Fl. Am. Sept. I. p. 174; Nutt. Gen. N. Amer. Pl. I. p. 150; DC. Prodr. I. p. 298; Spreng. Syst. Veg. I. p. 801; Rœm. et Schult. Syst. Veg. V. p. 373; Hook. Fl. Bor. Amer. I. p. 78; Torr. et Gray Fl. N. Amer. I. p. 140; A. Wood Class-Book Bot. p. 244; A. Gray Man. Bot. ed. 5, p. 79, et Syn. Fl. N. Amer. I. p. 204; Boissieu in Bull. Soc. Bot. France XLVII. p. 322.

Calcar slender, horizontal, obtuse-rounded at the end, longer than the petals, 10–15 mm. long.

Hab. Prov. UZES: Mt. Zyūō-tōge (*M. Nakamura!* May 19, 1893), Mt. Kimbō (*T. Nagasawa!* April 15, 1894).

Viola mirabilis Linn. Sp. Pl. p. 236, Cod. n. 6777; Houtt. Nat. Hist. XXIX. p. 137; Willd. Sp. Pl. I. p. 1167; Pers. Syn. Pl. I. p. 255; Spreng. Syst. Veg. I. p. 801; Rœm. et Schult. Syst. Veg. V. p. 377; Poir. Enc. meth. VIII. p. 634; Peterm. Deutsch. Fl. p. 65; DC. Prodr. I. p. 297; Ledeb. Fl. Alt. I. p. 259, et Fl. Ross. I. p. 250; Weinm. in Linnæa X. p. 66; Nyman Syl. Fl. Eur. p. 226; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 75; Maxim. Prim. Fl. Amur. p. 49, et in Mém. Biol. IX. p. 742; Regel Pl. Radd. I. p. 236; Franch. et Sav. Enum. Pl. Jap. II. p. 648; Korsh. in Act. Hort. Petrop. XII. p. 310; Boissieu in Bull. Soc. Bot. France XLVII. p. 322.

Viola apetala Gilib.

Viola brachysepala Maxim. Prim. Fl. Amur. p. 50.

Hab. Prov. ŌMI: Mt. Ibuki (*T. Makino!* May 1881, Nov. 4, 1893); Prov. SHINANO: Mt. Togakushi (*K. Usui!* Aug. 13, 1899); Prov. KŌDZUKE: Aramaki-mura (*T. Harasawa!* Oct. 1, 1901, June 1892).

Viola* (Nomimium) *kiusiana Makino sp. nov.

Caulescent, about 6 cm. or more high, estoloniferous, pallid-green. Tap-

root perpendicular, with delicate slender rootlets, white. Stems loosely tufted, ascending, radical and axillary to radical leaves, few to several, sparsely pilose with white patent hairs along one side. Leaves petioled, ciliated and sparsely pilose with white hairs above, nearly glabrous beneath; radical ones tufted, subovato-elliptical, obtuse at the apex, rounded at the base, regularly crenate, the midrib prominent beneath as are delicate and erect-patent veins, which are 3-6 on each side and pinnately disposed, the largest one about 2 cm. long, $1\frac{1}{2}$ cm. broad; the cauline ones smaller and placed towards the end; petiole shorter or longer than the blade, winged, ciliated with white patent pilose hairs; stipules adnate below, thinly membranaceous, pale-iridescent, subulato-lanceolate, acuminate, ciliato-fimbriate, 6-12 mm. long. Peduncles radical and in the axils of cauline leaves, arising above the leaves, gracile, sparsely pilose with patent hairs below, glabrous above, bracteate in the middle; bracteoles 2, approximate, linear, acuminate, ciliated-margined, pauci-glandular-dentate on the basal margins, 5-6 mm. long. Flowers small, about 12 mm. across, white? (or very light violet?). Sepals ovato-lanceolate, acute, membranaceous, glabrous, but interruptedly ciliated, 3-nerved without veinlets, iridescent, about 5 mm. long; basal auricles short, subtruncato-semiorbicular, ciliated. Petals oblong-obovate, rounded at the apex, attenuated below and a little oblique in form and 7-8 mm. long in the upper and lateral ones, beardless, but the lower one much shorter and concave; calcar very short, not exceeding beyond the basal auricles of the calyx, $1\frac{1}{3}$ -2 mm. wide. Connective-tip ovato-orbicular, rounded-obtuse, slightly shorter than the anther-cells; appendages very short, subrectangular-subdeltoid, obtuse-tipped, with a thick front edge. Ovary oval, rounded-obtuse, glabrous; style equal as long as the ovary, enlarged above, geniculated at the base; stigma subbilobato-orbicular, slightly concave, with a very short beak.

Hab. PROV. SATSUMA in Isl. Kiusiu: Kagoshima (*K. Tamura!* March 11, 1900).

A very distinct species among Japanese Violets. Though this is a caulescent and estoloniferous species, it seems to me to come near to *Viola diffusa* Ging., which is an acaulescent and stoloniferous species.

***Viola biflora* Linn. var. *crassifolia* Makino var. nov.**

About 8-15 cm. high; rhizome obliquely creeping, narrow; roots fibrous. Stem stouter, commonly 3-florous and 3-4-foliiferous, glabrous. Leaves

reniform or cordate-reniform, rounded or shortly produced with an obtuse or a mucronato-acute point at the apex, depressed-crenato-serrate with minutely mucronate tip, thick, glabrous, but very slightly pilose at the lower portion beneath, 15-25 mm. long, 15-34 mm. broad; veins impressed above, prominent beneath, reticulated towards the margin; petiole narrow, longer than the blade in the radical leaves (attaining the length of about 7 cm.) and the lower cauline one, but shorter in the upper cauline ones; stipule ovato-lanceolate, with mucronate tip, laxly glandular-crenulate on the margin, membranaceous, loosely nerved, 2-4½ mm. long. Pedicel erect, arising above the leaves, but shorter than leaves bearing the nutant capsule in those of cleistogamous flowers, gracile, glabrous, about 3-4 cm. long; bracteoles 2, opposite or subopposite, placed above the middle, minute, subulato-deltoid or oblong-lanceolate, mucronate-tipped, often minutely glanduloso-crenulate, 1½-2 mm. long. Flower yellow, about 1¼-1½ cm. across. Sepals glabrous, thin, obtuse, entire, 3-nerved, green, 4½-6 mm. long, the lower 2 lanceolate, others narrowly lanceolate; basal auricles very short, truncate. Petals oblong-obovate, narrowed towards the base, scarcely oblique in form, rounded at apex, entire, with 3 main nerves and very delicate veinlets, the upper 2 hardly smaller and 9-12 mm. long, 4-6 mm. wide, the lateral 2 11-13 mm. long, 4½-6 mm. wide, the lower one longer and broader, cuneately rhombo-obovate, attenuated at the base, shortly produced into the obtuse-tipped deltoid apex, entire, 12-14½ mm. long, 7-10 mm. broad; calcar short, conico-semiorbicular, thickish-walled, about 2 mm. long. Connective-tip broadly ovate, rounded-obtuse, membranaceous, somewhat shorter than the anther-cells; anther-appendages very short, subdeltoid, with a thick front margin. Ovary ovate, acute, glabrous; style a little longer than the ovary, enlarged above, geniculated at the base; stigma bilobed, the lobes ovato-orbicular. Capsule oval, obtuse, glabrous, 6-8 mm. long.

Hab. Prov. ETCHŪ: Mt. Tateyama (*R. Yatabe* and *J. Matsumura*! July 24, 1884); Prov. RIKUCHŪ: Mt. Iwate (*H. Sakurai*! herb. Imp. Mus. Sept. 1890).

This differs from the type principally by having the thicker glabrous and impressed-veined leaves and larger flowers. It was also collected on Mt. Iwate in the province of Rikuchū by Dr. Kazuma Jō, in 1901, and the name *Takane-sumire*, or alpine Violet, was proposed by him, and it is cultivated by Mr. Bunsai Ioki in Nikkō.

Primula cuneifolia Ledeb.*a. typica* Makino.

Primula cuneifolia Ledeb. in Mém. de l'Acad. d. sc. d. St. Petersb. V. (1814) p. 522, et Fl. Ross. III. (1846-51) p. 15; Regel et Til. Fl. Ajan. (1858) p. 111; Regel in Act. Hort. Petrop. III. 1, p. 150; Herd. Pl. Radd. IV. p. 115; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 56; A. Gray Syn. Fl. North Amer. II. 1, p. 59; Miyabe in Mem. Bost. Soc. Nat. Hist. IV. (1890) p. 249; Pax in Engler's Bot. Jahrb. X. p. 211; Makino in Bot. Mag., Tokyo, XIII. (1899) p. 83.

Primula cuneifolia Duby in DC. Prodr. VIII. p. 39.

Primula cuneifolia Makino in Bot. Mag., Tokyo, XI. (1897) p. 112, ex parte, non Ledeb.

Primula saxifragaeifolia Lehm. Monogr. Primul. (1817) p. 89, tab. 9; Rœm. et Schult. Syst. Veg. IV. (1819) p. 150, Add. p. 785; Spreng. Syst. Veg. I. (1825) p. 577; Duby in DC. Prodr. VIII. p. 39; Cham. et Schlecht. in Linnæa I. p. 212; Hook. Fl. Bor. Amer. II. p. 121; Hook. et Arn. Bot. Beechey's Voy. p. 128.

Hab. Hokkaidō [Ezo] (*L. Bœhmer!* herb. Sc. Coll. Imp. Univ. Tokyo), Mt. Atoia in Isl. Etorofu (*T. Kawakami*, Aug. 10, 1898), Isl. Riishiri (*T. Kawakami!* herb. ibid. Aug. 1899).

β. hakusanensis (Franch.) Makino.

Primula hakusanensis Franch. in Bull. de la soc. philomath. de Paris, 8 mai 1886, p. 6, et 14 avril 1888, p. 10; Pax in Engler's Bot. Jahrb. X. p. 211; Makino in Bot. Mag., Tokyo, XI. (1897) p. 112, et XIII. (1899) p. 83.

Primula cuneifolia Franch. et Sav. Enum. Pl. Jap. II. p. 429, non Ledeb.

Hab. Prov. KAGA: Mt. Hakusan (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 8, 1881).

γ. heterodonta (Franch.) Makino.

Primula heterodonta Franch. in Bull. de la soc. philomath. de Paris, 8 mai 1886, p. 7, et 14 avril 1888, p. 10; Pax in Engler's Bot. Jahrb. X. p. 211; Makino in Bot. Mag., Tokyo, XI. (1897) p. 112, et XIII. (1899) p. 83.

Leaves tufted, long-petioled, ovate, elliptical-ovate, or obovato-oblong, obtuse, acute and decurrent to the petiole below, irregularly or dublicately crenato-dentate, thin, glabrous, 2-5 cm. long, $1\frac{1}{2}$ -3 cm. broad, the inferior ones smaller spatulate-obovate and dentate; petiole usually longer than

the blade, broad. Scape usually 1, erect, terete, slender, exceeding the leaves in height, green, very minutely glandular, 9–15 cm. long in flower. Umbel 3–15-flowered; pedicel narrow, very minutely glandular, 8–12 mm. long, but attaining about 16 mm. in length in fruit, the outer ones erect-patent or patulous; bracts much shorter than the pediceles, linear, very minutely glandular. Flowers 22–30 mm. across, purple. Calyx campanulate, deeply 5-parted, green and often purplish above, very minutely glandular and glanduloso-ciliated, about $3\frac{1}{2}$ –6 mm. long; lobes erect, lanceolate, obtuse, with 3 main nerves. Corolla hypocrateriform; limb deeply 5-parted with closed sinuses, membranaceous, glabrous; lobes cuneate-obovate, 2-parted with an acuminate sinus, 10–14 mm. long, 8–11 mm. wide, the veins delicate and longitudinal; lobules oblong, somewhat oblique in form, obtuse, often scarcely crenulato-denticulate above; the throat greenish-yellow then soon becoming orange-yellow, white towards the outer border, radiately nerved, very minutely glandular; tube cylindrical, shorter than the limb, 5–8 mm. long, slightly enlarged and very minutely glandular above, very light purple. Stamens in the upper or middle portion of the corolla-tube; anther oblong, with a very short filament. Style erect, gracile, glabrous, long or short, the long one about 6–7 mm. long, the short one about $2\frac{1}{2}$ mm. long; stigma capitate; ovary somewhat depressed-globose, glabrous. Capsule oval-globose, $4\frac{1}{2}$ –5 mm. long, scarcely exceeding the persistent calyx, the carpel thin, but thicker and harder above, dehiscing into 7–9 deltoid lobes at the top. Seeds numerous, $1\frac{1}{3}$ mm. long, compressed, angulate, brown.

Hab. Prov. MUTSU: Mt. Iwaki (*Tomotarō Iwakawa!* herb. Sc. Coll. Imp. Univ. Tokyo, July 24, 1880); Prov. IWASHIRO: Mt. Iide-san (*K. Nemoto!* Aug. 24, 1895).

I obtained the favour of examining the living specimens from Dr. Kazuma Jō, which was collected on Mt. Iwaki by Dr. Tomosaburō Kinoshita.

Primula nipponica Yatabe in Bot. Mag., Tokyo, IV. (1890) no. 44, p. 3, tab. 13, et Iconogr. Fl. Jap. I. no. 1. (1891) p. 35, tab. 13; Makino in Bot. Mag., Tokyo, XIII. (1899) p. 82.

Primula cuneifolia Franch. in Bull. de la soc. philomath. de Paris, 8 mai 1886, p. 5, et 14 avril 1888, p. 10, non Ledeb.

Primula cuneifolia Makino in Bot. Mag., Tokyo, XI. (1897) p. 112, ex parte, non Ledeb.

Flowers small, about 10 mm. across; corolla constantly white!

Hab. Prov. UZEN: Mt. Gassan (*R. Yatabe* and *S. Okubo!* herb. Sc. Coll. Imp. Univ. Tokyo, July 23, 1887); Prov. Ugo: Mt. Chōkai (*R. Yatabe* and *S. Okubo!* herb. ibid. July 28, 1887); Prov. RIKUCHŪ: Mt. Kurikoma (*T. Makino!* Aug. 1890; *S. Ikeno!* herb. ibid. Aug. 1890), Mt. Iwate (*K. Watanabe!* July 12, 1895).

Primula farinosa Linn. Sp. Pl. p. 143, Cod. n. 1151.

var. armena C. Koch in Linnæa XVII. (1843) p. 308; Pax in Engler's Bot. Jahrb. X. (1889) p. 199; Makino in Bot. Mag., Tokyo, XI. (1897) p. 110.

Primula farinosa var. β . *luteo-farinosa* Regel in Act. Hort. Petrop. III. 1, (1874) p. 141.

Primula algida var. β . *luteo-farinosa* Rupr. in Mém. Biol. IV. p. 300, (1863).

Primula xanthophylla Trautv. et Mey. ex Pax in Engler's Bot. Jahrb. X. p. 199.

lusus japonica (Franch. et Sav.) Makino in Bot. Mag., Tokyo, XI. (1897) pp. 110, 111.

Primula farinosa var. β . *luteo-farinosa forma japonica* Franch. et Sav. Enum. Pl. Jap. II. (1876) p. 429.

Primula modesta Bisset et S. Moore in Journ. Bot. XVI. (1878) p. 134; Franch. in Bull. Soc. Philomath. Paris, 14 avril, 1888, p. 11.

Hab. Prov. SHIMOTSUKE: Nikkō (Herb.! Sc. Coll. Imp. Univ. Tokyo, June 20, 1878; *T. Makino!* June 9, 1901); Mt. Kōshin-zan (*T. Makino!* Sept. 12, 1901); Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *J. Matsu-mura!* herb. ibid. July 12, 1884); Prov. IYO: Mt. Ishidzuchi (*T. Makino!* Aug. 1885; *R. Yatabe!* herb. ibid. Aug. 9, 1888; *S. Yano!* herb. ibid. Aug. 10, 1890; *K. Okudaira!* July 1, 1894); Prov. TOSA: Mt. Kurotaki (*T. Makino!* Nov. 1892).

var. Fauriæ (Franch.) Miyabe in Mem. Bost. Soc. Nat. Hist. IV. (1890) p. 249; Makino in Bot. Mag., Tokyo, XI. (1897) pp. 110, 111.

Primula Fauriæ Franch. in Bull. Soc. Philomath. Paris, 8 mai, 1886, p. 8, et 14 avril 1888, p. 11; Pax in Engler's Bot. Jahrb. X. (1889) p. 211.

Hab. Prov. HIDAOKA: Samani (*K. Miyabe!* herb. Sc. Coll. Imp. Univ. Tokyo, June 18, 1884); Prov. KUSHIRO: Kusuri (*K. Miyabe!* herb. ibid. June 30, 1884); Prov. TESHIO: Mashike (*S. Hori!* herb. ibid. Aug. 31,

1887); Prov. CHISHIMA: Afunruimoi in Urup (*K. Uchida!* herb. ibid. June 25, 1891), W. coast between Iwanagawa and Inama in Urup (*K. Uchida!* June 18, 1891); Prov. RIKUCHŪ: Mt. Iwate (*K. Jō!* May 28, 1901).

The shape of leaves is different from that of *var. armena lusus japonica*.

Quercus Hondai Makino sp. nov.

Evergreen tree; bark thick, dark grey, rough with coarse old lenticels; wood hard, white, with coarse medullary rays. Branchlets narrow, terete, glabrous, castaneous when dried, disparsedly and minutely lenticellate. Bud narrowly conico-cylindrical, yellowish-brown; scales imbricated, ovate in the lower ones, but oblong or narrowly oblong in the superior ones, obtuse, membranaceous, thinly pubescent dorsally, tomentoso-villosely ciliated. Leaves petioled, angustato-lanceolate, narrowly acuminate, attenuated into a narrowly acute base and decurrent to the petiole, loosely serrate but entire towards the base, coriaceous, quite glabrous, green and shining above, paler and not glaucous beneath, about 6–14 cm. long including the petiole, 1–2½ cm. broad; midrib slender, prominent on both surfaces; veins 9–12 on each side, delicate, loose, erect-patent, arcuate upwards, reaching the margin; veinlets not conspicuous; petiole narrow, semiterete, glabrous, 8–16 mm. long, marginate above. Cupule..... Nut obovato-elliptical, obtuse and finely adpressed-tomentose at the top and apiculato-umbonate in its centre, truncate at the base, smooth, shining, pale-brown, about 1½ cm. long, 1 cm. across.

Nom. Jap. *Hanaga-gashi* (long-leaved Oak).

Hab. Prov. HYŪGA in Isl. Kiusiu: Takaoka-mura in Minami-Nakagōri (Herb. ! Dendr. Labor. Agric. Coll. Imp. Univ. Tokyo, 1901).

Probably this belongs to Sect. *Cyclobalanopsis*. Named in honour of Prof. Dr. Seiroku Honda in the Dendrological Laboratory, Agricultural College, Imperial University of Tokyo.

Rubus Hiraseanus Makino sp. nov. (An *Rubus coreanus* Miq. × *R. parvifolius* Linn. ?).

Stems terete, glabrous, stout, attaining about 8 mm. across, decumbent with a considerable length and rooting at the end, laxly prickly, reddish-

castaneous in the old one; prickles patent, straight or incurved, gracile, very sharp, attaining 5 mm. in length. Leaves as in those of *R. coreanus* Miq., but yellowish green (not deep green) and duller above and adpressed hoary-tomentose beneath (but pale green and thinly pubescent in those of the flowering branches) and the apex of the leaflets more obtuse as in those of *R. parviflorus* Linn. Cymes terminal and often axillary on the lateral branches of this year, $2\frac{1}{2}$ –10 cm. across; the rachis pubescent as are the peduncles and pedicels, rather densely many-flowered; peduncles patulous, loosely prickly or unarmed; pedicels erect-patent, unarmed, about 4–20 mm. long; bracts tripartite or trifold into linear lobes, shorter than the peduncles, attaining about 9 mm. long, pubescent; bracteoles minute, subulato-linear. Flowers about $1\frac{1}{4}$ – $1\frac{1}{2}$ cm. across, pedicellate. Calyx thickish, 5-parted, light green and pubescent and unarmed externally, white-tomentose internally in the lobes; lobes deltoid-lanceolate or oblong-lanceolate, setaceo-acuminate, reflexed and about $7\frac{1}{2}$ –8 mm. long in flower, but erect-patent in fruit; the tube depressed, lined by a glabrous disk within. Petals 5, small, erect and connivent, subrhomboid-orbicular or orbicular-ovate, obtuse and minutely bifid at the apex, minutely and irregularly eroso-serrulate, manifestly unguiculate, thinly puberulent in the lower portion and the unguis, purple, deciduous, 5–6 mm. long including the unguis which is $1\frac{1}{2}$ –2 mm. long, $3\frac{1}{2}$ – $5\frac{1}{2}$ mm. wide. Stamens numerous, erect, equalling the petals in height, attaining about 5 mm. in length; filament filiform, glabrous, white but rose above; anther minute, ovato-elliptical. Ovary-cluster nearly sessile, shortly ovoid, the receptacle depressed-conical, glabrous. Ovaries numerous, minute, densely placed, ovate, pubescent, attenuated to the style above; style terminal, slightly higher than the stamens and petals, filiform, very much longer than the ovary, pubescent below, rose-coloured above; stigma terminal, oblique, slightly dilated. Fruit depressed-globose, red afterwards turning black; drupels few to several, oval-globose, about 4 mm. across, succulent, minutely puberulent under lens, with a persistent style; stone elliptical, foveolate. Flowers May–June.

Hab. Prov. Ōmi: Hikone (*T. Makino!* Nov. 1894; *S. Hirase!* July 1901, June 8, 1902).

Probably a hybrid between *Rubus coreanus* Miq. and *R. parvifolius* Linn. This grows strongly and intricately at some place in the vestige of the ancient castle in Hikone, prov. Ōmi; it was found at first by me in November, 1894. I have named it in compliment to Mr. Sakugorō Hirase, who kindly sent me many complete specimens, both in flowers and in fruits.

Rubus coreanus Miq. was introduced long ago, and it is now rarely found growing wild in Tokyo by escape.

***Caltha palustris* Linn. var. *pygmæa* Makino var. nov.**

Roots fasciculate, fibrous, more or less thick towards the base, laxly with short rootlets. Radical leaves tufted, decumbent-spreading, long-petioled, broadly ovate, ovato-reniform, orbicular-reniform, or subsagittato-ovate, with an acute opened sinus and relatively large ovate lobes, depressed-crenate but crenato-dentate in the lobes, membranaceous, flaccid, about 18–26 mm. long, 16–22 mm. wide in flower, but attaining about 4 cm. in length and in width after anthesis; veins impressed above, laxly reticulated; petiole slender, semiterete, with an adnate (but shortly free at its apex) broad transparent membranaceous vagina at the base; cauline leaf shortly petiolate, smaller, the vagina free from the petiole and thinly membranaceous. Peduncle decumbent, subtrigonous, longer than the leaves including the pedicel, and attaining about 12 cm. in length in flower, uniflorous without any cauline leaf, or bi-florous with a cauline leaf, the pedicel slender. Flower yellow, 15–17 mm. across, 5–6-sepaled. Sepals horizontally patent, oblong, obtuse, entire, longitudinally impressed-nervate, greenish dorsally. Stamens numerous, about two-thirds as long as the sepals, erect-patulous, yellow; filament clavato-filiform; anther elliptical. Carpels about 7, lanceolate, laterally compressed, attenuated into a very short style above, viridescent; stigma minute, recurved.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* April and July 1902).

This is commonly cultivated in Nagoya and its vicinity, prov. Owari. It is yet unknown to me in wild state, but it is said to grow wild in the province of Ise. It is comparable to var. *γ. minima* Regel.

***Viola sylvestris* Kitaib. var. *japonica* (Ging.) Makino.**

Viola canina ε. ? *japonica* Ging. in DC. Prodr. I. p. 298; A. Gray in Perry's Exped. Jap. p. 308.

Viola canina Sieb. et Zucc. in Abhandl. Akad. Münch. IV. 2, p. 169; Hoffm. et Schult. Nom. ind. pl. Jap. ed. nov. p. 63, non Linn.

Viola grypoceras A. Gray l. c.; Franch. et Sav. Enum. Pl. Jap. I. p. 43, et II. p. 289.

Viola sylvestris γ. *grypoceras* Maxim. in Mél. Biol. IX. p. 743.

Viola Reichenbachiana Franch. et Sav. l. c. I. p. 42, non Jordan.

Viola longepedunculata Franch. et Sav. l. c. II. p. 286.

Viola sylvatica Kanitz Anthoph. Jap. p. 25, non Fries.

Viola sylvatica var. *imberbis* A. Gray Bot. Jap. p. 382.

Viola Grayi Franch. et Sav. l. c. II. p. 288.

Viola Riviniana Franch. et Sav. l. c. I. p. 43, non Reichb.

Nom. Jap. *Yabu-sumire*, *tachi-tsubosumire*.

Hab. Japan.

Very common and variable plant, widely distributed over Japan. A white-flowered form is sometimes met with.

Viola (Nomimium) **acuminata** Ledeb. Fl. Ross. I. p. 252; Walp. Repert. II. p. 766; Maxim. Prim. Fl. Amur. p. 50; Regel Tent. Fl. Ussur. p. 25; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 115; Hance in Journ. Bot. 1875, p. 131; Franch. Pl. David. I. p. 44; De Boiss. in Bull. Soc. Bot. de Fr. XLVII. p. 322.

Viola canina var. *acuminata* Regel Pl. Radd. I. p. 247; Maxim. in Mél. Biol. IX. p. 746, et Enum. Pl. Mongol. I. p. 80; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 52; Korsh. in Act. Hort. Petrop. XII. p. 310; Miyabe Fl. Kuril. Isl. p. 219; Palib. Consp. Fl. Kor. I. p. 31.

Viola laciniosa A. Gray in Perry's Exped. Jap. p. 308, et Bot. Jap. p. 382; Franch. et Sav. Enum. Pl. Jap. I. p. 43, et II. p. 289.

Viola micrantha Turcz.

The following description is made from the specimens collected on Mt. Kobotoke-tōge in the boundary of prov. Musashi and Kai, and it is of smaller size than the examples of the northern Japan.

Caulescent, about 10–11 cm. high in flower; rhizome short, erect or oblique, densely rooting. Stems about 2 to 3, erect, foliiferous throughout, terete, glabrous, light green, purple below, $1\frac{2}{3}$ –3 mm. across. Leaves alternate, ovato-cordate, shortly acuminate with an obtuse tip, with an opened sinus, crenate or crenato-serrate, glabrous above, pubescent on the nerves beneath, 18–40 mm. long, 17–32 mm. wide in flower, the inferior ones diminished in size and often purplish beneath; veins 4–5 on each side, incumbent-arcuate, the lowest one branched at the base on the outside; the petiole longer or shorter than the blade, narrow, glabrous, attaining about

4½ cm. in length; stipules shorter than the petiole, erect, free, but the lower ones sometimes adnate at the base, linear-lanceolate, or broadly linear, or linear, acuminate, fimbriato-laciniate with linear teeth, subtilely ciliated, thin, green, 6–20 mm. long. Peduncles axillary, gracile, 6–8 cm. long, glabrous, bracteate above the middle, bracteoles 2, opposite or subopposite, linear, acuminate, puberulent, 6–7 mm. long. Flowers white or very light cerulescent, 10–15 mm. across. Sepals linear or linear-lanceolate, narrowly acuminate, very laxly and minutely hairy dorsally, light green, 6–10½ mm. long, the lower two a little larger and 3-nerved, the others one or subtrinnerved; basal auricles very short, truncato-rounded or retuso-truncate in the lower two sepals, but others obtuse. Petals obovato-oblong, narrowed below, rounded at the apex; the upper ones about 10–13 mm. long, 3⅔–6 mm. wide, reflexed and horizontal; the lateral ones slightly longer than the upper ones, bearded, about 11–14 mm. long, 4–6½ mm. wide; the lower one cuneato-obovate, retuse or emarginate, violet-striped, about 8–9 mm. long, 5½–6 mm. wide; calcar very short, ovato-semiorbicular, very obtuse, 2–3 mm. long. Connective-tip ovato-deltoid; appendages short, oblong-linear, or ovato-linear, obtuse. Ovary conical, glabrous; style longer than the ovary, somewhat geniculate at the base, gradually a little enlarged above; stigma obovate, convex, shortly papillose on margin, the beak very short and truncate at the end.

Hab. Prov. MUSASHI: Mt. Kobotoke-tōge (*T. Makino!* May 18, 1902).
This species is common in the northern Japan.

Iris (*Apogon*) **minuta** Franch. et. Sav. Enum. Pl. Jap. II. pp. 42, 521; Maxim. in *Mél. Biol.* X. p. 715; Baker *Handb. Irid.* p. 2.

Small, densely tufted; rhizome repent and then ascending, branched, slender, hard, covered with membranaceous scales; roots numerous, fibrous, filiform, numerously ramose, hard. Flowers and leaves in different innovations, approximate or more or less remote. Leaves few to the rhizome-branch, with a few sheathing leaves at the base, the lower ones much smaller and manifestly vaginate and soon perishing, the uppermost one normally growing and angustato-ensiform, subcalloso-margined, gradually narrowed below, vaginate at the base, 2–8 mm. broad, attaining 45 cm. in length, but much shorter in flower and lower or higher than flowers, yellowish darkish-green; midrib delicate, subtilely scabrous in flower; veins 1–2 on each side. Scape 1-headed, erect, short, about 5–10 mm. long,

but 7–10 cm. high including the flower, enclosed with about 3 vaginate-leaves which attain about 7 cm. in the longest ones, the basal old sheaths splitting into fibres; pedicel about 12–20 mm. long, gracile. Spathe 1-flowered; valves 2, complicate, oblanceolate, acute, narrowed below, narrowly carinate dorsally, membranaceous, viridescent, scarious towards the margin, several to many-nerved with very loose and delicate transverse veinlets, 3–3½ cm. long, the lower one slightly larger and very shortly tubular below. Flower small, about 2½–3 cm. across, yellow! Perianth-tube narrowly cylindrical, but stout-filiform when dried, about equal to or hardly shorter than the segments, glabrous, about 20–25 mm. long. Sepals broadly anguiculate, beardless; unguis erect-patent, longitudinally 3-ridged and yellow with minute brown spots internally, greenish-yellow externally, about 4 mm. across in the top but gradually a little narrower below, about 13 mm. long; the limb patent and then slightly deflexed, shorter than the unguis, oval, scarcely emarginate, entire, thin, at the base with a ridge which comes from the unguis below and a brown colour, yellow internally, brownish-purpurascens externally, about 10 mm. long, 8–8½ mm. wide, the midveins 3, the lateral veins erect-patent and rather many. Petals shorter than the sepals, but slightly longer than the unguis of sepals, erect, long-anguiculate, thin; the limb obovate, or obovato-elliptical, retuse, entire, yellowish, with a few and loose veins; the unguis narrow, canaliculate, purplish. Stamens 3; filaments filiform, a little longer than the anther; anthers oblong-linear, white with purple colour. Style-branches erect-patent, slightly higher than the petals, pale-yellow, truncate at the base, about 11 mm. long including the crest, 3 mm. broad; crest-lobes narrowly deltoid or ovato-lanceolate, acutish or acuminato-acute, often obscurely pauci-denticulate on the outer edge, about 4 mm. long; stigmatic lobe minute, semiorbicular. Ovary entirely enclosed within the spathe, obtusely trigonous, oblong-cylindrical, long-stipitate, light green, smooth, about 8–10 mm. long; stipe pale, longer than the ovary, 14–23 mm. long. Capsule subglobose. Fl. April.

Nom. Jap. *Kin-kakitsubata* (golden-flowered Iris).

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* April 18, 1888, flowers, July 26, 1888, adult leaves, May 1, 1902, young leaves, July 19, 1902, adult leaves).

I have no knowledge of its wild-growing locality being known only in cultivation. This is perhaps the plant described by Maximowicz in the note under *Iris minuta* Franch. et Sav. in Mém. Biol. X. p. 715, from Siebold's manuscript drawings. Also, this may be Franchet et Savatier's *Iris minuta*, though the authors describe the flower to be "pallide cærulei,

lamina sepalorum venis purpureis percursa," but really it must be yellow, the flowers of the dried specimens will lose soon their natural colour and appear as if it is pale bluish with deeper coloured delicate veins, as incautiously written by the authors as quoted above.

The plant of Honzō-Dzufu (Phonzo zoufu) vol. 23, fol. 11 recto, fig. sinistra, which was referred to *Iris minuta* by Franchet et Savatier, is evidently a different species, and it may be a form of *Iris gracilipes* A. Gray.

Iris (Apogon) ruthenica Dryand. γ . **nana** Maxim. in Mél. Biol. X. p. 705; Palib. Consp. Fl. Kor. III. p. 6.

Iris ruthenica Maxim. Prim. Fl. Amur. Suppl. pp. 477, 485.

Small; rhizome slender, obliquely horizontal, hard, branched, brown, covered with old fibres of leaves, furnished with dried leaves of last year at the neck; roots strong, with many branches which also repeatedly ramose. Leaves 3-6, linear, attaining about 14 cm. long and 3-6 mm. wide in flower, but attaining about 37 cm. long, $7\frac{1}{2}$ mm. wide after anthesis, acuminate, the one side deep-green, and other side more or less glaucous; the midrib somewhat distinct; veins 2-4 on each side; the sheath manifest, opened; the basal leaves sheath-form, tinged with purple. Scape 1-headed, short, ascending, covered with few scaly leaves which are tinged with purple below and above, about 6-10 cm. high including the flower; pedicel equalling the scape in length, 9-20 mm. long. Spathe 1-flowered; valves 2, oblong-lanceolate, acuminate, many-nerved, ecarinate, about $2\frac{1}{2}$ cm. or more long, turged, light green, tinged with purple towards the margin. Perianth-tube clavato-cylindrical, about $1\frac{1}{4}$ cm. long. Sepals about 4 cm. long, broadly unguiculate; unguis lighter than the limb in colour, longitudinally striate with purple internally, very light green externally; the limb slightly shorter than the unguis, oblong, about 8 mm. broad, finally subconduplicate, shortly bifid at the apex, spreading and more or less deflexed and geniculate with the unguis, violet, substriped with white and violet in centre of the lower portion. Petals erect, angustato-oblongate, narrowly unguiculate, revolute-margined, membranaceous, violet, about $3\frac{1}{2}$ cm. long. Stamens about 2 cm. long, adherent to the base of sepals; filament linear; anther shorter than the filament, linear, ceruleous. Style-branches erect-patent, purple-violet, about $2\frac{1}{2}$ cm. long, 5 mm. broad; crest-lobes 2, obliquely ovate, acute, incised-denticulate on the outer side; stigma minute, with a subulate lobe. Ovary

concealed within the spathe, cylindrical-oblong, shortly stipitate, many-ovuled. Capsule subglobose. Fl. April.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* April and July 1902).

This is known only in cultivation in Japan.

Iris (*Apogon*) **Rossii** Baker in Gard. Chron. 1877, II. p. 809, et Handb. Irid. p. 3; Maxim. in Mém. Biol. X. p. 714; Bretsch. Hist. bot. disc. in China p. 705; Palib. Consp. Fl. Kor. III. p. 6.

Iris iyoana Makino in Bot. Mag., Tokyo, XIII. (1899) p. 111 (nomen tantum).

Small, densely tufted; rhizome slender, shortly creeping, branched, hard, densely covered with splitting fibres of old leaves; roots filiform, hard, with short rootlets. Leaves (normal) 2, erect, angustato-linear, very acuminate, gradually attenuated below, thin and grass-like in texture, glabrous, 2-3-nerved, about 12-25 cm. long and $1\frac{1}{2}$ -6 mm. wide in flower, but attaining about 45 cm. after anthesis, with few narrow acuminate membranaceous and often purplish vagina-leaves below. Scape 1-headed, 7-15 cm. high including the flower, erect, arising at the side of the leaf-tuft from the top of rhizome-branches, 4-30 mm. long, gracile, enclosed with 3 or 4 narrow acuminate glabrous membranaceous and often purplish sheaths, the uppermost sheath larger and attaining about 5 cm. in length; pedicel gracile, 10-32 mm. long. Spathe 1-flowered; valves 2, linear-lanceolate to linear, acuminate, membranaceous, not firm, glabrous, closely many-nerved, viridescent, 4- $6\frac{1}{2}$ cm. long, the lower one slightly shorter. Flower 3- $4\frac{1}{2}$ cm. across, violet, sometimes light violet, rarely white. Perianth-tube long and very slender, a little enlarged towards the top, 3- $6\frac{1}{2}$ cm. long. Sepals unguiculate; the limb patent, elliptical or oblong-elliptical, rounded at the apex, acute and decurrent to the unguis below, entire, thinly membranaceous, beardless, white with an orange centre in the middle of the lower portion, 15-20 mm. long, 8-13 mm. broad; the unguis erect-patent, broadly linear, thickish excepting the narrow membranaceous margins, brownish-orange and longitudinally ridged internally, shorter than the limb and 7-9 mm. long. Petals erect-patent, shorter than the sepals, obovate, or spatulato-obovate, rounded or sometimes retuso-emarginate at the apex, unguiculate, thinly membranaceous, 17-22 mm. long including the unguis and $6\frac{1}{2}$ -9 mm. wide; the unguis narrow, shorter than the limb. Anther linear, $3\frac{1}{2}$ - $5\frac{1}{2}$ mm. long, with white pollen; filament filiform, a little longer

than the anther. Style long, filiform; style-branches suberect, one-half as long as the sepals, subsagittato-truncate at the base, linear-rectangular, about 3 mm. wide, thin, in centrè with 2 close narrow and longitudinal lamellæ which are becoming into the crest-lobes above; crest-lobes erect, linear-lanceolate, obtuse or acute, thin, 4-8 mm. long; stigma short, semiorbicular. Ovary oblong, subtrigonus, glabrous, stipitate, about $4\frac{1}{2}$ mm. long; stipe 7-9 mm. long. Capsule globose, about 7 mm. across. Fl. April.

Hab. Prov. IYO in Isl. Shikoku: Koshiore-yama (*K. Okudaira!* April 4, 1897, April 16, 1899); Prov. CHIKUZEN in Isl. Kiusiu: Wakasugi-yama in Kasuya-gōri (*K. Nagano!* May 1897).

This is found growing wild in the northern parts of Isl. Shikoku and Kiusiu, and it is also distributed over Corea and Northern China.

Iris (*Apogon*) **albopurpurea** Baker in Curtis's Bot. Mag. (1896) tab. 7511; Makino in Bot. Mag., Tokyo, XIV. (1900) pp. 60, 61.

a. **Bakeri** Makino l. c. p. 61.

Flower white; sepals maculate with cæruleo-violet.

Nom. Jap. *Washinoo*.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* May 1899).

Not common.

Jap. *Murasame* is a form of this variety, and the sepals are less cæruleoviolet-maculate.

β. **genuina** Makino l. c.

Flower entirely cæruleo-violet.

Nom. Jap. *Kakitsubata*.

Icon. Inuma's Sōmoku-Dzūsetsu II. no. 4.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* May 1896, May 1899), Bot. Gard. Koishikawa in Tokyo, cult. (Herb. ! Sc. Coll. Imp. Univ. Tokyo April 30, May 11, 1880), Sambōzi-ike, subspont. (*T. Makino!* May 20, 1900).

A common and typical form.

γ. **alba** Makino l. c.

Flower white, immaculate.

Hab. Japan, cult.

Very rare.

The common form of this species has violet flowers, and it is the typical one (*β. genuina* Makino), bearing the common name of *Kakitsu-*

bata; the white, and white-violascent forms, which were descended from the violet-flowered one, are found uncommonly, and the white-violascent form is that described under the name of *Iris albopurpurea* by Baker. This is a native species, but it is commonly now known only in cultivation.

Platanthera (Bifoliae, Monophylike) **nipponica** Makino sp. nov.

Tubers 2, radiceform, oblong-fusiform at the base. Stem 25-44 cm. high including the raceme, very slender, furnished with 2 cataphylls at the base. Leaves 3-8; the lowest one which is situated in the lower part of the stem largest and normal being broadly linear, acute, evaginate or very shortly vaginate at the base, erect, 4-7 cm. long, 5-7½ mm. wide; the superior ones much smaller, bract-like, linear, acuminate, evaginate, erect, distant, 6-28 mm. long. Raceme erect, laxly 4-6-flowered, 3-6½ cm. long; rachis slender; bracts subulato-lanceolate, acuminate, half the length of the ovary. Flower viridescens, about 4-7 mm. across. Sepals obtuse, membranaceous, 1 or 3-nerved; the dorsal one erect, ovate; lateral ones deflexed down, very slightly longer than the dorsal one, oblong, somewhat oblique in form. Petals erect, galeate with the dorsal sepal and equal to him in length, carnosulate, oblong-lanceolate or ovato-oblong, very obtuse, 2-nerved. Labellum a little longer than the perianth, simple, carnos, oblong-ligulate, or narrowly oblong, slightly attenuated below, obtuse, 3-4½ mm. long. Calcar slender, transversely turned backwards and curved upward, 1½ or 1⅓ as long as the ovary, obtuse, slightly and gradually incrassate towards the apex, 7-14 mm. long. Ovary cylindrical, curved, 5-9 mm. long.

Hab. Prov. RIKUCHŪ: Mt. Kurikoma (*T. Makino!* Aug. 1890); Prov. ETCHŪ: Mt. Tate-yama (*S. Ikeno!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 3, 1892); Prov. IYO: Hatadera (*K. Okudaira!* June 1894), Near Matsuyama (*Z. Umemura!* July 4, 1897); Prov. BIRCHŪ: Mt. Abemi-yama (*Z. Yōshino!* July 1901).

This species comes nearest to *Platanthera tipuloides* Lindl., or its variety?

Cymbidium scabroserrulatum Makino sp. nov.

Terrestrial; caespitose. Roots densely tufted, simple, elongate, stout, fleshy, yellowish-pale. Pseudobulbs not large, erect or ascending, ovate to clavato-obovate, aggregated, hard, about 1¼ cm. across, the internodes short, the

nodes furnished with splitting leaf-fibres. Leaves elongate, erect and recurved above, fasciculate with about 3-9, linear, gradually attenuated towards both ends, shortly acuminate, serrulato-scabrous on margin, rigidly coriaceous-chartaceous, coriaceous and canaliculate internally and subcarinate dorsally below, tubular and membranaceous-margined at the base, nervate, with a furrow in centre on the upper surface, green, concolorous, slightly shining, glabrous, 28-80 cm. long, 7-13 mm. broad; midrib slender, prominent beneath as are the lateral main veins which are one on each side; veinlets 6-17 in whole number. Scape shorter than the leaves including the raceme, lateral, erect, terete, glabrous, with membranaceous acuminate many-nerved sheaths; the upper sheaths usually apart, usually tubular below, but the uppermost one often without the tube, the longest one attaining nearly 5 cm., the basal ones gradually shorter and imbricated. Raceme erect, shorter than the scape, more or less secundly and laxly 5-10-flowered; rachis straight or subflexuous, glabrous, subterete, often somewhat obtusely angulate, viridescent or often more or less purplish as is the scape, 10-15 cm. long; bracts slightly shorter than the ovary, narrowly lanceolate, acuminate, membranaceous, with 3 main nerves 7-21 mm. long. Flowers about $3\frac{1}{2}$ -5 cm. across, slightly odoriferous. Perianth yellowish-viridescent, often shaded with light purple externally, thickish, entire; outer perianth patent and at length more or less deflexed backwards, equal in size, linear-lanceolate, sharply acute, 5-nerved, $2\frac{1}{3}$ - $3\frac{1}{2}$ cm. long, $4\frac{1}{2}$ -6 mm. wide, the lateral ones scarcely oblique in form; inner perianth directed forwards, shorter than the outer ones, narrowly lanceolate, acute or acutish, entire, scarcely oblique in form, 5 or 7-nerved, 2- $2\frac{2}{3}$ cm. long, $5\frac{1}{2}$ -nearly 7 mm. wide, longitudinally purple in centre below. Labellum sessile with the rounded-obtuse and yellow base, $2\frac{1}{4}$ - $2\frac{3}{4}$ cm. long, obscurely 3-lobed; lateral lobes erect, rounded and entire-edged, white as is the disk, purple-margined and purple barred in the intramarginal portion, the disk thick, with many and minute purple spots within the central canal, the ridges closely approximate, risen in the front portion and rounded-obtuse at its end; the midlobè much reflexed, ovato-lanceolate, longer than the disk, acutish or subobtuse, crisped-margined, thickish, viridescent, papilloso-pubescent and irregularly blotched with purple, 15-17 mm. long, 7-8 mm. broad. Gynostemium erect, arcuate forwards, compressed, 12-14 mm. long, 4-5 mm. wide, glabrous, yellow above and whitish below, purple-spotted on the front surface; clinandrium obliquely truncate, subdeltoid, with the obtuse or shortly produced dorsal edge; anther depressed-semiorbicular, truncate on the front margin; pollinia 4, deltoid-orbicular, compressed, yellow, waxy, the inner ones smaller, the gland

lunate. Ovary narrowly cylindrical, shorter than the outer perianth, glabrous, 16–25 mm. long including the short pedicel. Fl. April.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* April 1902).

Native of China; it was recently introduced, and cultivated in Tokyo, under the name of *Ikkei-kyūka* (一莖九花). The leaves resemble very closely those of *Cymbidium virescens* Lindl. (Jap. *Hokuwo*).

Elæagnus Yoshinoi Makino sp. nov.

Shrub, attaining about 3 m. in height; the trunk and main branches armed with many thorns; branches and branchlets darkish-grey, darkish brownish-grey, darkish brown, or castaneous, appressed-leprous; branchlets alternate, those of this year tomentose with gilvous or rufous peltate scurfs which are provided with stellato-fasciculate hairs in its centre. Bud ovate, covered with bay-ferruginous scurfs. Leaves deciduous, alternate, shortly petiolate, oblong-lanceolate, elliptical, ovate, or broadly ovate, from acuminate to abruptly very shortly acuminate with an obtuse tip, rounded or obtuse or acute at the base, entire, 3–8 cm. long, $1\frac{1}{2}$ –5 cm. broad, membranaceous, sparsely pubescent with stellate hairs above, pubescent-tomentose with pale-brown stellate soft hairs beneath, but the inferior leaves moreover dispersed with rufo-ferruginous peltate scurfs beneath; midrib impressed above and prominent beneath as are lateral veins which are delicate erect-patent and about 5–9 on each side; veinlets inconspicuous; petiole 3–5 mm. long, tomentose with stellate hairs, canaliculate in front. Flower solitary, axillary, pedicellate; pedicel short, gracile, tomentose with scurfs and stellate hairs, 4–8 mm. long. Perigone about $1\frac{3}{4}$ –2 cm. in whole length, 10 mm. or more across when full-expanded, dispersed with stellate scurfs, but tomentose in the basal tube; lobes (superior limb) 4, patulose, rounded-ovate, shortly acuminate, greenish-yellow, not thick, 5–6 mm. long; the inferior limb quadrangular-cylindrical, slightly enlarged above, not thick, glabrous within, longitudinally 8-nerved, obtuse at the base, about $3\frac{1}{2}$ mm. across; the perigone-tube shorter than the inferior limb, about 4–5 mm. long, narrow, linear-cylindrical, very slightly attenuated above, thickish, persistent. Stamens 4, inserted to the throat of the perigone-limb, alternate with the lobes; anther oblong, about 2 mm. long; filament very short, dorsifixed. Pistil a little exceeding the throat of the perigone-limb in height; style gracile, glabrous, stigmatiferous portion curved; stigma lateral, linear, about $2\frac{1}{2}$ mm. long; ovary concealed within the perigone-tube; cylindrical, attenuated to the style above, glabrous,

about $2\frac{1}{2}$ mm. in length. Fruit slightly depressed-globose, red when mature, spotted with silvery scurfs, with a sour-sweet and slightly astringent juice, pedicel stout, short, densely covered with silvery scurfs and stellate hairs (after Z. Yoshino). Fl. May.

Nom. indig. *Natsu-asadori*.

Hab. Prov. BITCHŪ: Sayodani in Zyōbō-gōri (Z. Yoshino! May, and Aug. 16, 1902).

The pubescent-tomentose leaves stand alone among those of all other Japanese species of *Elaeagnus*. The fruit matures in June and is edible and the size is as that of *Prunus tomentosa* Thunb. (after Z. Yoshino). I have named it in compliment to Mr. Zensuke Yoshino, of Takahashi, prov. Bitchū, who discovered and collected it and kindly sent me the specimens.

Viburnum (*Lentago*, Asiatica) **bitchiuense** Makino sp. nov.

Shrub, attaining about 3 m. in height; branchlets brownish-grey, slender, glabrate, but those of this year furfuraceo-tomentose with stellate hairs; bud naked, narrowly oblong, furfuraceo-tomentose with stellate hairs, rose-coloured. Leaves opposite, very shortly petioled, elliptical, broadly ovate, or obovato-elliptical, obtuse or acutish at the apex, obtuse or subcordate at the base, repand-crenate with a mucronate tip, subcoriaceo-membranaceous, deep green and thinly pubescent with simple and stellate hairs above, paler and furfuraceous with dispersed stellate hair beneath, 4-9 $\frac{1}{2}$ cm. long, 2 $\frac{1}{4}$ -7 cm. wide, the young leaves furfuraceo-tomentose; midrib prominent beneath; veins 5-7 on each side, loose, erect-patent, branched and anastomosing towards the margin, prominent beneath; veinlets inconspicuous; petiole covered with stellate hairs, about 3-7 mm. long. Inflorescence peduncled, about 4-5 cm. across in fruit; bracts and bracteoles caducous; peduncle straight, dispersedly furfuraceous with stellate hairs as are 1st pedicels, 3-5 cm. long in fruit; 1st pedicels umbellate, erect-patent, strict, about 5 in number, about 1 $\frac{1}{3}$ -1 $\frac{2}{3}$ cm. long in fruit, capitately 4-5-flowered towards the top. Flower..... Fruit about 1-3 to a 1st pedicel, very shortly pedicellate, approximate, oblong, about 10 mm. long, 5-6 mm. wide, very compressed, black when dried, crowned with a short persistent style and 5-parted ovate-lobed persistent calyx. Putamen oblong, plano-compressed, longitudinally 2-sulcate on one surface, but the other surface longitudinally 2-ridged and the central groove deeper. Seed plano-compressed, about 9 mm. long, 4 $\frac{1}{2}$ mm. broad.

Hab. Prov. BITCHŪ : Kawanose in Hongō-mura (*Z. Yoshino!* June 1902).

Though my specimens have no flower, enough is, however, recognizable to make it a good new species. Bud is as that of *Viburnum furcatum* Blume.

Viburnum japonicum (Thunb.) Spreng.

a. typicum Makino.

Viburnum japonicum (Thunb.) Spreng. Syst. Veg. I. p. 934; Maxim. in Mél. Biol. X. p. 664.

Cornus japonica Thunb. Fl. Jap. p. 63; Willd. Sp. Pl. I. p. 662; Rœm. et Schult. Syst. Veg. III. p. 320; DC. Prodr. IV. p. 273.

Viburnum macrophyllum Van Hall in Sieb. et de Vriese Ann. Hort. et Bot. Fl. Jard. Pays-Bas, II. p. 97, cum tab.; Hoffm. et Schult. Noms indig. Pl. Jap. ed. nov. p. 62, non Thunb.

Viburnum Buergeri Miq. Ann. Mus. Bot. Lugd.-Bat. II. p. 268, et Prol. Fl. Jap. p. 156; Franch. et Sav. Enum. Pl. Jap. I. p. 201, et II. p. 381; Kanitz Anthoph. Jap. p. 15.

Leaves petioled, subrhombico-ovate, or subrhombico-oval, or subrhombico-ovovate, acuminate or shortly so, broadly cuneate or obtuse at the base, repand-crenate.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* July 5, 1884, May 4, 1896), Id. Bot. Gard. Koishikawa, cult. (Herb. ! Sc. Coll. Imp. Univ. Tokyo, May 6, 1879); Prov. HIZEN: Nagasaki (Herb. ! *ibid.* May 12, 1879); Prov. HIGO: Hyakkwanzeki (Herb. ! *ibid.* May 29, 1879); Prov. SATSUMA: Shiroyama in Kagoshima (*R. Yatabe* and *J. Matsumura!* herb. *ibid.* Aug. 7, 1882); Prov. ŌSUMI: Fumoto in Minami-Ōsumi-gōri (Herb. ! *ibid.* March 14, 1891); Prov. IZU: Isl. Miyake (*S. Ōkubo!* herb. *ibid.* May 2, 1887), Isl. Hachidō (*S. Ōkubo!* herb. *ibid.* May 10, 1887); Prov. ŌMI: Near Echigawa, cult. (*T. Makino!* April 1902).

β. boninsimense Makino var. nov.

Viburnum sempervirens? herb. Sc. Coll. Imp. Univ. Tokyo, non C. Koch.

Viburnum sp. Matsum. Catal. Pl. Herb. Coll. Sc. Imp. Univ. Tokyo, (1886) p. 87.

Leaves subrhomboidal, or subrhombico-rounded, or subreniform-rounded, abruptly very shortly produced at the apex, truncato-cuneate or truncato-subcordate at the base, repand-crenate or obscurely so, shining above, 9-11½ cm. long, 9-13 cm. broad; petiole 2½-4 cm. long. Corymb condensed; flowers about 6 mm. across. Stamens shorter than those of the *typica*.

Hab. Isl. Bonin (*R. Yatabe* and *J. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, Dec. 10, 1879; Herb. ! *Y. Tanaka*).

***Viola* (Nomimium) *Yazawana* Makino sp. nov.**

Acaulescent; rhizome erect or ascending, thick, pale, closely articulated, covered with brown old petiole-bases and old stipules, rooting throughout, 1½–3 cm. long; roots slender, white, with loose and short rootlets. Leaves few to several, erect, or ascending, deltoid-cordate, acuminate with a mucronato-acute tip, auriculate with an open deep sinus and ovate or ovato-rounded lobes at the base, depressed-crenato-serrate, membranaceous, clearly green, yellowish-viridescent when dried, not variegated, concolorous, thinly pubescent above, glabrous beneath, with loose veins, 3½–7½ cm. long, 3–6 cm. broad after anthesis; petiole longer than the blade, slender, exalate, glabrous, attaining 11 cm. long after anthesis, pale-green, but purplish below; stipules subulato-linear, narrowly attenuated above, adnate at the base, membranaceous, pale, laxly glanduloso-ciliated on the margin, 6–8 mm. long. Peduncle about 1 to a stock, very slightly exceeding the leaves in height, gracile, glabrous, pale-green, 5½–7½ cm. long, bracteate above the middle; bracts 2, approximate, linear, acutish, one-nerved, few-glandular on the basal margin, about 4 mm. long. Flower white, about 1½ cm. across. Sepals lanceolate, or broadly lanceolate, acutish, glabrous, green, narrowly hyalino-margined, with 3 main nerves and very loose veinlets, 5–6 mm. long; basal auricles short and truncate, entire, glabrous. Petals obovato-elliptical, rounded at the apex, but retuse in the lower one, attenuated towards the base, beardless, 10–12 mm. long, 5–6½ mm. wide; calcar very short, small, scrotiform, 3 mm. long and broad. Connective-tip rounded-ovate, obtuse, a little shorter than the anther-cells; appendages thick, curved, shortly lunato-falcate, with an obtuse tip, about 2 mm. long. Ovary conical, acute, glabrous; style slightly exerted above the anther, clavato-cylindrical, glabrous; stigma subcordate, with a very short beak. Capsule oblong-elliptical, acutish, longer than the persistent sepals, glabrous, maculate with purple, about 8 mm. long.

Hab. Prov. SHINANO: Mt. Togakushi (*K. Matsuoka*! July 1901; *K. Tanaka*! May 1902).

A rare species; it should be grouped with *Viola vaginata* Maxim. and *V. Matsumurce* Makino, but it is smaller.

I have named it in honour of Mr. Komesaburō Yazawa, Professor in the Nagano Normal School in prov. Shinano.

Viola variegata Fisch. ; Spreng. Syst. Veg. I. p. 797 ; Rœm. et Schult. Syst. Veg. V. p. 392 ; DC. Prodr. I. p. 293 ; Ledeb. Fl. Ross. I. p. 244 ; Bunge Enum. Pl. China boreal. p. 7 ; Maxim. Prim. Fl. Amur. p. 48 ; Id. in Mém. Biol. IX. p. 728 ; Id. Enum. Pl. Mongol. I. p. 79, n. 197 ; Regel Tent. Fl. Ussur. p. 24 ; Id. Pl. Radd. I. p. 223, tab. 6, fig. 1-4 ; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 34 ; Franch. Pl. David. I. p. 42 ; Baker et S. Moore in Journ. Linn. Soc. XVII. p. 379 ; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 56 ; Korsh. in Act. Hort. Petrop. XII. p. 310 ; Palib. Consp. Fl. Kor. I. p. 36 ; De Boiss. in Bull. Soc. Bot. d. France XLVII. p. 320.

Viola maculata Patr. herb. ex Ging in DC. Prodr. I. p. 293, non Cav.

var. nipponica Makino var. nov.

Acaulescent ; rhizome erect or oblique, $\frac{1}{2}$ -5 cm. in length, attaining about 5 mm. in diameter, subarticulated, the internode sometimes elongated ; roots few, immediately divided below the rhizome, elongate, white, with short rootlets. Vaginae of the neck of rhizome subovate or elliptical, trifid, membranaceous, pale-iridescent. Leaves few to many, erect, long-petioled, ovate-elliptical, or orbicular-ovate, or orbicular, cordate with a more or less opened or closed sinus and rounded lobes, obtuse or rounded-obtuse, compressed-crenate, subthickly membranaceous, discolorous, deep green (and subvariegated along the nerves?) above, purple beneath, pulvereo-pubescent on both surfaces, attaining $6\frac{1}{4}$ cm. long and 5 cm. broad after anthesis ; veins 3-4 on each side, erect-patent, arcuate, the lowest one branched on the outside ; petiole longer than the blade, slender, very narrowly marginate above, pulvereo-pubescent, attaining about 14 cm. long after anthesis ; stipules subulato-linear, or linear-lanceolate, attenuated above, adnate with the basal portion or the lower half portion, loosely glanduloso-fimbriato-dentate or loosely glanduloso-ciliated, puberulent above, thin, pale-iridescent, about 6-10 mm. long. Peduncles shorter than the leaves in fruit, gracile, pulvereo-pubescent, bracteate above the middle ; bracts 2, approximate, subulato-linear to angustato-linear, with an obtuse or acute tip, pulvereo-pubescent, thin, pauci-glanduloso-ciliated on the basal margin 4-10 mm. long. Sepals lanceolate, acutish or obtuse, pulvereo-pubescent, subtilely ciliated, thin, green, hyaline towards the margin, with 3 main nerves and loose delicate veinlets, 5-7 mm. long ; basal auricles semior-

bicular or subsquare, rounded or truncate or retuse at the apex, usually subtilely ciliated. Petals violaceous. Capsule elliptical to oblong, truncato-obtuse, longer than the persistent sepels, pulvereo-pubescent, 7-9 mm. long.

Hab. Prov. SHINANO: Bank in Arayasu-mura (*K. Tanaka!* May 1902). Rare; this is larger than the typical form.

Mitella (*Mitellaria*) **acerina** Makino sp. nov.

Perennial, attaining about 35 cm. in height. Rhizome erect or oblique, elongate, attaining about 10 cm. in length, thicker above, rooting, estoloniferous, nigrescent, hard, covered with old brown vaginæ toward the neck. Leaves tufted, erect-patent, long-petiolate, few to several, cordato-rotund in outline, usually acuminate, cordate at the base with a deep subclosed sinus, palmately 7-fid with sharp sinuses; lobes deltoid or deltoid-ovate, acuminate or acute, lobulate and inciso-serrate with deltoid or deltoid-ovate acute teeth, flaccidly herbaceous, membranaceous when dried, purple-green, thinly pilose above, glabrous beneath, palmate-nerved, 5-9 cm. long, 5-8 cm. broad; petiole longer than the blade, glabrous, attaining 12 cm. in length; vaginæ ovate or broadly ovate, obtuse, free from the petiole above, membranaceous, rufous-brown, entire-margined, 10-18 mm. long. Scapes few to several, exceeding the leaves in height, erect, elongate, longer than the raceme, glabrous below, shortly and dispersedly glanduloso-hairy and very laxly dispersed with minute sterile scaly bracts above, sometimes furnished with a small leaf in the lower portion. Raceme angustate, 7-8 mm. across, erect, densely and secundly many-flowered, attaining 10 cm. or more long; rachis slender, dispersedly and shortly glanduloso-hairy. Flowers 9-10 mm. across, but about 4 mm. across in calyx, pedicellate; pedicels short, erect-patent, equal to or shorter than the flowers, sparsely and shortly glanduloso-hairy and very minutely puberulent; bracts minute, membranaceous, subulato-deltoid or rounded-deltoid, acute, often glanduloso-subdenticulate, about one-half as long as the pedicel; bracteoles very minute, ovato-subulate, or oblong. Calyx 5-parted, thinly dispersed with minute granular glands externally; lobes erect, but reflexed above, deltoid, mucronato-acute, entire, membranaceous, one-nerved; tube depressed-obconical, adherent to ovary within excepting the upper portion, acute or subobtuse at the base. Petals 5, patent, longer than the calyx-lobes, $3\frac{1}{2}$ -4 mm. long, 3-parted below the middle into setaceo-linear lobes, dispersedly granuloso-glandular dorsally, viridescent-purple, the lateral lobes erect-patent and shorter than the mid-

lobe. Stamens 5, opposite with petals and closely placed before them, shorter than the calyx-lobes; anther broadly cordato-rotund; filament very shortly subulate. Disk thickish, flat on surface. Style short, erect, shortly attenuated above; stigmas 2, approximately placed, thick, depressed, oblong-semiorbicular, obtuse-edged, very obscurely bilobed. Ovary 1-celled; ovules minute, rather many.

Hab. Prov. WAKASA: Near Kumagawa (*K. Tsuzi!* April 10, 1901).

Rare species; this differs from *Mitella japonica* Miq. (= *M. longiscapa* Makino) by its smaller and denser flowers, 3-fid petals, semiglabrous leaves, glabrous petiole, sterile bracts upon the scape, etc.

Potentilla (Herbaceæ, Multicipites, Terminales, Ternatæ, Frigidæ, Niveæ)

Matsuokana Makino sp. nov.

Perennial, attaining about 20 cm. in height. Rhizome erect, or ascending, narrow, hard, rooting below, covered with old petioles and old rufo-ferruginous ample stipules. Leaves ternate, adpressed-niveo-tomentose beneath, adpressed-sericeo-pubescent above. Radical leaves tufted, erect-patent, petioled, ternate, about 13-24 mm. long, 15-30 cm. broad; midrib prominent beneath; lateral veins delicate, flabellato-pinnate, impressed above as is the midrib; leaflets deeply serrate with obtuse or acutish ovate teeth, but entire towards the base, rounded-obtuse at the apex; the terminal leaflet shortly petiolulate, rounded to elliptical, attaining about 18 mm. long, 14 mm. broad, truncato-cuneate to broadly cuneate at the base; lateral leaflets sessile, somewhat smaller, rounded to ovato-elliptical, obliquely cuneate at the base; petiole longer than the blade, attaining about 4 cm. long, slender, adpressed-white-tomentose; stipules often ample, subulato-lanceolate, acuminate, entire, adnate about one-half below, membranaceous, thinly tomentose above, minutely glanduloso-puberulent under lens, attaining about 17 mm. long. Cauline leaves smaller, shortly petioled: stipules lanceolate or subulato-lanceolate, often longer than the petiole and adnate to it with the lower portion. Flowering stems erect, few to several, much exceeding the radical leaves in height, slender, adpressed-white-tomentose, about 1-5-flowered, furnished with 2 leaves below; bracts few, leaf-like, reduced in size in the superior ones, ternate or simple, very shortly petioled, deeply pauci-serrate above, adpressed-white-tomentose beneath, adpressed-pubescent above, the stipules ovato-lanceolate, acute-acuminate, longer than the petiole, adnate below; pedicels slender, $1\frac{1}{2}$ - $5\frac{1}{2}$ cm. long, erect, adpressed-

white-tomentose, often furnished with minute, subulato-linear, entire or subbifid, 2-approximate bracts above. Flower about 18 mm. across, yellow. Calyx 5-parted, patent, about 10-11 mm. across, adpressed-piloso-pubescent externally, ciliated, green, persistent; lobes deltoidly ovato-lanceolate, acute, entire, the midrib delicate, veinlets irregularly anastomosing with vertical areolae; bracteoles linear, obtuse, shorter than the calyx-lobes, adpressed-pubescent, ciliated, green. Petals 5, patent, exceeding the calyx-lobes in length, sessile, obovato-cuneate, truncate or subemarginate, entire, about 6 mm. long, 5 mm. broad. Stamens many, attaining about $2\frac{1}{3}$ mm. long; filament filiform, glabrous; anther broadly rounded, bifid at the base. Ovary-cluster globose, about $2\frac{1}{2}$ mm. across; receptacle sessile, pilose. Ovaries numerous lunato-elliptical, obtuse at both end, glabrous, about $\frac{2}{3}$ mm. long; style subterminal, filiform, glabrous, two-times as long as the ovary, with a terminal stigma.

Hab. Prov. SHINANO: Mt. Togakushi (*K. Matsuoka!* July 1901).

A rare species; it comes near to *Potentilla Hookeriana* Lehm., a North-American species, but the flowers are fewer, leaflets more shallowly serrate, and the tomentum adpressed.

Mazus Miquelii Makino nom. nov.

Vandellia? *japonica* Miq. in Ann. Mus. Bot. Lugd.-Bat. II. (1865-6) p. 118, et Prol. Fl. Jap. p. 50; Franch. et Sav. Enum. Pl. Jap. I. p. 346.

Mazus japonicus Makino in Bot. Mag., Tokyo, XI. (1897) p. 391, et XV. (1901) p. 96, non O. Kuntze.

Mazus rugosus $\beta?$ *stolonifer* Maxim. in Mém. Biol. IX. p. 403, (1874).

Mazus stolonifer Makino in List of Seeds, Bot. Gard. Imp. Univ. Tokyo, (1896) p. 17.

Mazus rugosus β . *macranthus* Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 344.

Mazus rugosus γ . *rotundifolius* Franch. et Sav. l. c.

Nom. Jap. *Sagi-goke*, *hazena*.

Hab. Japan, widely distributed.

forma albiflora Makino.

Mazus japonicus var. *albiflorus* Makino in Bot. Mag., Tokyo, XI. (1897) p. 391, et XV. (1901) p. 96.

Nom. Jap. *Sagi-shiba*.

Hab. Prov. SAGAMI; MUSASHI; AWA (Bōshū).

var. contractus Makino var. nov.

Perennial, attaining about 5 cm. in height. Stem erect or ascending, covered with leaves throughout, often rooting. Leaves contracted, closely placed, opposite, reflexed, densely imbricated as to form together a column which is about $1\frac{1}{2}$ cm. in diameter, shortly petioled, orbicular or broadly orbicular, rounded or emarginate at the apex, cordate or subcordate at the base, paucidentate, attaining about 10 mm. long, 14 mm. wide, thickly herbaceous, deep-green, shining, rugose. Racemes terminal or axillary, very short, few or several-flowered. Flowers smaller; calyx thinly glanduloso-pubescent below; corolla purple.

Nom. Jap. *Zyakago-sō*.

Hab. Prov. MUSASHI: Tokyo, rarely cultivated.

This has a curious appearance and was recently brought to Tokyo from Nagoya, prov. Owari.

Mazus japonicus (Thunb.) O. Kuntze Revis. Gen. Pl. II. (1891) p. 462, non Makino.

Lindernia japonica Thunb. Fl. Jap. (1784) p. 253; Willd. Sp. Pl. III. (1800) p. 326; Pers. Syn. Pl. II. (1807) p. 166.

Mazus rugosus Lour. Fl. Cochinch. (1790) p. 385, et ed. Willd. (1793) p. 468; Ait. Hort. Kew. ed. 2, IV. (1812) p. 53; Spreng. Syst. Veg. II. (1825) p. 803; Benth. in DC. Prodr. X. p. 375, et Fl. Hongk. p. 247; Herd. Pl. Radd. IV. p. 297; Maxim. Prim. Fl. Amur. p. 205, Suppl. p. 475, et in Mém. Biol. IX. p. 402; Regel Tent. Fl. Ussur. p. 119; Seem. Bot. Voy. 'Herald' p. 402; Miq. Fl. Ind. Bat. II. p. 677, et Prol. Fl. Jap. p. 48; A. Gray in Perry's Exped. Jap. II. p. 316; Franch. et Sav. Enum. Pl. Jap. I. p. 344; Franch. Pl. David. I. p. 222; Kanitz Anthoph. Jap. p. 11; Debeuax Fl. Schangh. p. 97, Fl. Tchef. p. 336, et Fl. Tients. p. 58; Hook. fil. Fl. Brit. Ind. IV. p. 259; Hillebr. Fl. Hawai. Isl. p. 324; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 183; Makino in Bot. Mag., Tokyo, XI. p. 391; Henry in Trans. Asiat. Soc. Jap., Suppl. p. 67; Palib. Consp. Fl. Kor. II. p. 20; Diels in Engl. Bot. Jahrb. XXIX. p. 566; Bretschn. Hist. Eur. Bot. Disc. in China pp. 197, 219, et 608.

Tittmannia obovata Bunge Enum. Pl. Chin. Boreal. p. 49; Bretschn. l. c. p. 337.

Vandellia obovata Walp. Repert. III. p. 294.

Mazus vandellioides Hance in Walp. Ann. III. p. 193; Bretschn. l. c. p. 368.

Hornemannia bicolor Willd.

Mazus bicolor Benth.

Gratiola goodeniaefolia Hornem.

Columnnea tomentosa Roxb. Fl. Ind. III, p. 98, non Oerst.

Stemodia tomentosa G. Don.

Nom. Jap. *Tokiwa-haze*.

Hab. Japan; common and widely distributed.

Crawfurdia trinervis (Thunb.) Makino nom. nov. non D. Dietr.

Convolvulus trinervis Thunb. Fl. Jap. (1784) p. 85; Lam. Encycl. méth. Bot. III. (1789) p. 543; Willd. Sp. Pl. I. (1797) p. 860; Pers. Syn. Pl. I. (1805) p. 179; Roem. et Schult. Syst. Veg. IV. (1819) p. 298; Spreng. Syst. Veg. I. (1825) p. 596.

Crawfurdia japonica Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 3, (1846) p. 160; Miq. Prol. Fl. Jap. p. 288; Franch. et Sav. Enum. Pl. Jap. I. p. 324; Walp. Ann. I. p. 516; S. Moore in Journ. Bot. (1880) p. 4; C. B. Clarke in Journ. Linn. Soc. XIV. p. 443, et in Hook. fil. Fl. Brit. Ind. IV. p. 107; Maxim. in Mém. Biol. IX. p. 399; Gilg in Engl. et Prantl Pfl.-Fam. IV. 2, p. 80, fig. 37 F, G.

Golowninia japonica Maxim. in Mém. Biol. IV. p. 41, cum tab.

Galacomine japonica Maxim. herb. ex Miq. Prol. Fl. Jap. p. 288.

Crawfurdia fasciculata Griff. Notul. Pl. Asiat. IV. (1854) p. 92; Henry in Trans. Asiat. Soc., Suppl. p. 61, non Wall.

Crawfurdia fasciculata Hemsl. in Journ. Linn. Soc. XXVI. p. 122, ex parte, non Wall.

Gentiana volubilis D. Don Prodr. Fl. Nep. (1825) p. 126.

Nom. Jap. *Tsuru-rindō*.

Hab. Prov. TOSA: Kitagawa in Nanokawa-mura (*T. Makino!* Nov. 3, 1887), Mt. Yokogura (*T. Makino!* Sept. 4, 1889); Prov. IWAKI: Hirono (*T. Makino!* Aug. 15, 1890); Prov. MUSASHI: Ōmiya-hachiman (*T. Makino!* Oct. 3, 1897), Mt. Takao (Herb. ! Sc. Coll. Imp. Univ. Tokyo, Aug. 24, 1878), Mt. Mitsumine (*Y. Yabe!* herb. ibid. Oct. 27, 1900); Prov. SHIMOTSUKE: Mt. Nikkō (*R. Yatabe!* herb. ibid. Aug. 2, 1877; Herb. ! ibid. Oct. 1, 1879), Konsei-tōge in Nikkō (*K. Sawada!* herb. ibid. Oct. 3, 1879; *J. Matsumura!* herb. ibid. July 22, 1885), Kanuma (Herb. ! ibid. Sept. 25, 1879); Prov. SHINANO: Mt. Ondake (*R. Yatabe* and *J. Matsumura!* herb. ibid. July 27, 1880), Mt. Togakushi (*R. Yatabe* and *J. Matsumura!*

herb. *ibid.* July 12, 1884); Prov. Iwashiro: Mt. Iide (Herb. ! *ibid.* Aug. 13, 1878); Prov. RIKUZEN: Kanomata (Herb. ! *ibid.* Aug. 23, 1878); Prov. UZEN: Mt. Rokuzyūri-goe (*R. Yatabe* and *S. Ōkubo* ! herb. *ibid.* July 22, 1887); Prov. KAGA: Mt. Hakusan (*R. Yatabe* and *J. Matsumura* ! herb. *ibid.* Aug. 8, 1881); Prov. SAGAMI: Hakone (*S. Ōkubo* ! herb. *ibid.* Dec. 30, 1886); Prov. IDZU: Mt. Amagi (*S. Ōkubo* ! herb. *ibid.* June 9, 1883); Prov. YAMATO: Mt. Kasuga (*J. Matsumura* and *S. Ōkubo* ! herb. *ibid.* July 15, 1883); Prov. IYO: Ofuki in Nii-gōri (*K. Watanabe* ! herb. *ibid.* Sept. 24, 1891); Prov. OSHIMA in Hokkaidō: Esashi (*K. Miyabe* and *Y. Tokubuchi* ! herb. *ibid.* Aug. 4, 1890); Prov. ISHIKARI: Sapporo (*Y. Tokubuchi* ! herb. *ibid.* Sept. 6, 1890; *Id.* ! Sept. 8, 1892); Hokkaidō (*J. Böhmer* ! herb. *ibid.*).

A Javan *Crawfordia trinervis* D. Dietr. is *Crawfordia Tripterospermum* (Bl.) m. (= *Tripterospermum trinerve* Blume Bijdr. p. 849 (1826). = *Crawfordia Blumei* G. Don.)

Physalis Alkekengi Linn. var. **monstrifera** Makino var. nov.

Flower monstrously alternating into a raceme form, peduncled, pendulous, simple or few-branched, about 4–10 cm. long including the peduncle; calyx many-divided, sparse on the rachis which is a much elongated receptacle, sessile, spreading and curved downwards, boat-shaped, acuminate, at first viridescens and then minaceous, reticulately nervate; corolla, stamens, and pistil suppressed and absent. Stem and leaves as in the type.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino* ! Aug. 16, 1895).

A rare and curious garden variety.

Alchemilla vulgaris Linn. Sp. Pl. p. 123, Cod. n. 1015; Houtt Nat. Hist. XXV. (1777) p. 371; Willd. Sp. Pl. I. p. 698; Pers. Syn. Pl. I. p. 149; Roem. et Schult. Syst. Veg. III. p. 468; Spreng. Syst. Veg. I. p. 454; Lamk. Illustr. tab. 86, fig. 1; Lamk. et DC. Fl. Fr. ed. 3, V. p. 451; Peterm. Deutsch. Fl. p. 168; Engl. Bot. tab. 597; DC. Prodr. II. p. 587; Hook. Fl. Bor.-Am. I. p. 197; Torr. et Gray Fl. N. Amer. I. p. 432; Ait. Hort. Kew. ed. 2, I. p. 278; Ledeb. Fl. Alt. I. p. 152, et Fl. Ross. II. p. 29; Nyman Syl. Fl. Eur. p. 275; Berg Pharm. Bot.

(1860) p. 350, et Charakt. ed. 2, (1861) p. 79, tab. 63, fig. 481; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 201; Benth. Handb. Brit. Fl. ed. 5, p. 140; Focke in Engl. et Prantl Pfl.-Fam. III. 3, p. 43.

Nom. Jap. *Hagoromo-gusa* (nom. nov.).

Hab. Prov. SHINANO: Mt. Shirouma-dake in Hokuzyō-mura, Kita-Adzumi-gōri (*M. Orii*! Aug. 29, 1902).

Rare, and new to the Flora of Japan. I possess a specimen through the kindness of Mr. M. Orii. It was also collected in the same mountain by Mr. Y. Yabe.

Saxifraga (Nephrophyllum) **cernua** Linn. Sp. Pl. p. 403, Cod. n. 3164; Houtt. Nat. Hist. XXVI. p. 557; Willd. Sp. Pl. II. p. 632; Pers. Syn. Pl. I. p. 489; Spreng. Syst. Veg. II. p. 363; Don in Transact. Linn. Soc. XIII. p. 364; Engl. Bot. tab. 664; Peterm. Deutsch. Fl. p. 210; Ait. Hort. Kew. ed. 2, III. p. 123; Ledeb. Fl. Alt. II. p. 122, et Fl. Ross. II. p. 219; Reg. et Tiling Fl. Ajan. p. 96; Nyman Syl. Fl. Eur. p. 256; Hook. Fl. Bor.-Amer. I. p. 245; Hook. et Arn. Bot. Beech. Vey. p. 124; Torr. et Gray Fl. N. Amer. I. p. 573; Ser. in DC. Prodr. IV. p. 36; Hook. fil. et Thoms. in Journ. Linn. Soc. II. p. 63; Engler Monogr. Gatt. Saxifr. p. 106; Id. in Engl. et Prantl Pfl.-Fam. III. 2a, p. 55; Benth. Handb. Brit. Fl. ed. 5, p. 169; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 238; Clarke in Hook. fil. Fl. Brit. Ind. II. p. 391.

Lobaria cernua Haw.

Saxifraga bulbifera Gunn.

? *Saxifraga sibirica* Torr. et Gray Fl. N. Amer. p. 573, ex Engler.

? *Saxifraga Cymbalaria* Torr. et Gray l. c. p. 574, ex Engler.

Nom. Jap. *Mukago-yukinoshita* (nom. nov.).

Hab. Prov. SHINANO: Alpine summit of Peak Aka-gake in Mt. Yatsuga-dake (*Kōichi Tanaka*! August 1902).

Rare, and new to the Flora of Japan.

Hosta Sieboldiana Engl. = *Hemerocallis Sieboldiana* Lodd. = *Funkia Sieboldiana* Hook. = *Saussurea Sieboldiana* O. Kuntze.

var. glauca Makino var. nov.

Leaves smaller, thicker, glaucous on both surfaces.

Icon. Iinuma's Sōmoku-Dzusesetsu VI. no. 26

Nom. Jap. *Tokudama*.

var. nigrescens Makino var. nov.

Leaves smaller, narrower, acuminate, firmly thick, subconvolute on the lower margin, darkish-green.

Icon. Inuma's l. c. no. 27.

Nom. Jap. *Kuro-gibōshi*.

The above two varieties are sometimes found cultivated.

Epipogum aphyllum Swartz; Reichb. fil. in Walp. Ann. III. p. 593; Nyman Syl. Fl. Europ. p. 353; Sowerby Engl. Bot. IX. p. 131, tab. 1486; Benth. Handb. Brit. Fl. ed. 5, p. 439; Hook. fil. Fl. Brit. Ind. VI. p. 124.

Epipogium aphyllum Richard.

Epipogon aphyllus Pfitzer in Engl. et Prantl Pfl.-Fam. II. 2, p. 111, fig. 111.

Epipogum Gmelini Richard.

Epipogium Gmelini Spreng. Syst. Veg. III. p. 696; Peterm. Deutsch. Fl. p. 554, tab. 86, fig. 679; Lindl. in Journ. Linn. Soc. I. p. 176; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 601; Hook. fil. Stud. Fl. Brit. Isl. ed. 2, p. 378.

Epipogon Gmelini Ledeb. Fl. Ross. IV. p. 77; Hook. in Bot. Mag. tab. 4821; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 184.

Satyrium Epipogium Linn. Sp. Pl. p. 945, Cod. n. 6837; Houtt. Nat. Hist. XXX. p. 499; Poir. Encycl. méth. Bot. VI. p. 581; Pers. Syn. Pl. II. p. 507.

Limodorum Epipogium Swartz; Willd. Sp. Pl. IV. p. 129; Lam. et DC. Fl. Franc. ed. 3, III. p. 264.

Epipactis Epipogium All.

Serapias Epipogium Steud. (sphalm.).

Epipactis Epipogium Crantz.

Epipogum Gmel. Fl. Sib. I. p. 12, tab. 2, fig. 2.

Nom. Jap. *Torakichi-ran* (nov.).

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (*Torakichi Kamiyama!* September 1902, sent by *K. Jō* and *B. Ioki*).

Very rare, and new to the Flora of Japan. The *Torakichi-ran* named for the collector, who found out it first in Japan.

Neottia Nidus avis Rich.; Spreng. Syst. Veg. III. p. 707; Peterm. Deutsch. Fl. p. 557, tab. 87, fig. 684; C. Koch in Linnæa XXII. p. 290; Ledeb. Fl. Ross. IV. p. 81; Koch. Syn. Fl. Germ. et Helv. ed. 3, p. 603; Nyman Syl. Fl. Europ. p. 354; Reichb. fil. in Walp. Ann. III. p. 595; Benth. Handb. Brit. Fl. ed. 5, p. 439; Hook. fil. Stud. Fl. Brit. Isl. ed. 2, p. 380; Benth. et Hook. fil. Gen. Pl. III. p. 595; Sowerby Engl. Bot. IX. p. 122, tab. 1478; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 183; Pfitzer in Engl. et Prantl Pfl.-Fam. II. 6, p. 114, fig. 114; Finet in Bull. Soc. Bot. France XLVII. p. 270.

Ophrys Nidus avis Linn. Sp. Pl. p. 948, Cod. n. 6841; Houtt. Nat. Hist. XXX. p. 503; Lam. Encycl. méth. Bot. IV. p. 566; Engl. Bot. tab. 48.

Epipactis Nidus avis Crantz; Willd. Sp. Pl. IV. p. 87; Pers. Syn. Pl. II. p. 513; Lam. et DC. Fl. Franc. ed. 3, III. p. 260.

Listera Nidus avis Hook.

Serapias Nidus avis Steud.

Neottidium Nidus avis Schlecht.

Nidus Nidus avis Kuntze Rev. Gen. Pl. II. p. 674.

Neottia macrostelis Peterm. in Flora XXVII. (1844) p. 369.

Neottia orobanchoidea St. Lag.

Nom. Jap. *Sakane-ran* (K. Miyabe).

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (*B. Ioki!* July 1900, sent by K. Jō).

Rare. This was also collected in Sobetsu (1887), Abashiri (1890), Toya (1893), Yarashi (1893), and Towada by Revd. Urb. Faurie. The species reported by Mr. T. Kawakami, in Botanical Magazine, Tokyo, vol. XIII. (1899) p. 266, and by me in Idem vol. XIV. (1900) p. 184, under the name of *Neottia kamtschatica*, is not Sprengel's and but *Neottia Nidus avis* Richard.

Neottia camtschatea Reichb. fil. (= *Neottia kamtschatica* Spreng. = *Neottia kamtschatica* Lindl. = *Ophrys camtschatea* Linn. = *Epipactis camtschatea* Swartz = *Ophrys kamtschatica* Georgi = *Epipactis kamtschatica* Lindl. = *Serapias camtschatea* Steud. = *Ophrys aphylla* Gmel.) is not yet found in Japan and has the following habits: stem 8 cm. long, filiform; raceme as long as the stem; flowers laxly disposed; perianth patent; sepals ovate; petals smaller than the sepals, linear, obtuse; labellum lineari-lanceolate, double as broad as the petals and triple as long, bifid, the lobes attenuate, straight.

Neottia micrantha Lindl. ; Ledeb. Fl. Ross. IV. p. 82 ; Benth. et Hook. fil. Gen. Pl. III. p. 595 ; Makino in Bot. Mag., Tokyo, XIV. p. 184 ; Finet in Bull. Soc. Bot. France XLVII. p. 270.

Nidus? micranthus Kuntze Rev. Gen. Pl. II. p. 674.

Nom. Jap. *Hime-muyōran*.

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (*S. Okubo!* July 1898; *S. Mohara!* July 1898); Prov. SHINANO: Mt. Yatsugadake (*K. Jō!* July 15, 1902); Prov. SURUGA: Mt. Fuzi (*Y. Yabe!* July 1902).

Rare. Revd. Urb. Faurie also collected it in Isl. Rūshiri in June 1891.

Calypso bulbosa (Linn.) Reichb. fil. ; Id. in Walp. Ann. III. p. 551.

Cypripedium bulbosum Linn. Sp. Pl. p. 951, Cod. n. 6876 ; Houtt. Nat. Hist. XXX. p. 547 ; Poir. Encycl. méth. Bot. VI. p. 383.

Calypso borealis Salisb. ; Spreng. Syst. Veg. III. p. 733 ; Pursh Fl. N. Amer. II. p. 593 ; Ledeb. Fl. Ross. IV. p. 52 ; Nyman Syl. Fl. Europ. p. 353 ; Hook. Fl. Bor.-Amer. II. p. 195 ; Bot. Mag. tab. 2763 ; Cham. et Schlecht. in Linnæa III. p. 34 ; Maxim. Prim. Fl. Amur. p. 267 ; Regel et Tiling Fl. Ajan. p. 121 ; Fr. Schm. Reis. in Amur. u. Ins. Sachal. p. 181 ; A. Gray Man. Bot. ed. 5, p. 508 ; A. Wood Class-Book Bot. 1877, p. 686 ; Pfitzer in Engl. et Prantl Pfl.-Fam. II. 6, p. 131, fig. 128, N.

Limodorum boreale Swartz in litt. ex Willd. Sp. Pl. IV. p. 122 ; Pers. Syn. Pl. II. p. 521.

Cymbidium boreale Swartz.

Orchidium boreale Swartz.

Norna borealis Wahlenb.

Cytherea borealis Salisb.

Calypso americana R. Br. in Ait. Hort. Kew. ed. 2, V. p. 208 ; Nutt. Gen. N. Amer. II. p. 195 ; Spreng. Syst. Veg. III. p. 733.

Orchidium americanum Steud.

Orchidium arcticum Swartz.

Serapias scapo unifloro Gmel. Fl. Sib. I. p. 7, tab. 2, fig. 1.

Nom. Jap. *Hotei-ran!*

Hab. Japan.

Though I have not yet seen the specimen collected in Japan, I have pictures drawn from Japanese specimens by Japanese artists about fifty years ago ; so that it is enumerated here as occurring in Japan.

Gastrodia viridis Makino sp. nov.

Stem and flowers green.

Nom. Jap. *Ao-tenma*.

Icon. Iwasaki's Honzō-Dzufu V. fol. 23 verso-24 recto, sinistra; Honzō-Tsūkwan-Shōdzu (本草通串證圖) IV. fol. 14 verso.

Hab. Japan.

Very closely allied to *Gastrodia elata* Bl., and it is found rarer than that. For the full description refer the forcoming page.

Prunus Persica Sieb. et Zucc. var. **densa** Makino var. nov.

Amygdalus Persica var. Savat. Livr. Kwa-wi p. 93.

Prunus Amygdalus Maxim. in Mém. Biol. XI. p. 670, ex parte, non Baill. excl. syn. *Amygdalus communis* Linn.

Shrub attaining about $1\frac{2}{3}$ m. in height; branches short, stout, terete, glabrous. Leaves dense, spreading, angustato-lanceolate, acuminate, gradually narrowed towards the base, serrulate throughout, glabrous, deep green, about 13-18 cm. long, $1\frac{1}{2}$ -3 cm. broad; petiole about 8-22 mm. long, canaliculate in front, bi-glandular at the upper end. Flowers dense, about 4 cm. across, simple, rose-coloured.

Nom. Jap. *Amendō, kara-momo, edo-momo, seiwōbo*.

Icon. Iwasaki's Honzō-Dzufu LXII. fol. 12 verso-13 recto; Kwa-wi Arb. II. fol. 16.

Hab. Prov. Tosa: Sakawa, cult. (*T. Makino!*); Prov. MUSASHI: Tokyo, cult. (*T. Makino!* Oct. 1902).

The flower of the normal form of this variety is simple and rose-coloured as written above, but there are also forms with double, white, flesh-coloured, or 2-coloured flowers. This was formerly introduced from China.

Rhododendron indicum Sweet var. **macrostemon** (Maxim.) Ōkubo et Makino.

Rhododendron macrostemon Maxim. Rhodod. As. Orient. p. 41, tab. 3, fig. 15-20; Franch. et Sav. Enum. Pl. Jap. I. p. 292; Ōkubo in Bot. Mag., Tokyo, IX. p. 40.

Nom. Jap. *Misome-kirishima*.

This dwarf shrub is only found in garden.

Gynostemma pentaphyllum (Thunb.) Makino nom. nov.

Vitis pentaphylla Thunb. Fl. Jap. (1784) p. 105; Spreng. Syst. Veg. I. (1825) p. 778; Planch. in DC. Monogr. Phanerog. V. 2, p. 627.

Cissus pentaphylla Willd. Sp. Pl. I. p. 659; Pers. Syn. Pl. I. p. 143; Roem. et Schult. Syst. Veg. III. p. 314; DC. Prodr. I. p. 631.

Alsomitra cissoides Roem.

Zanonia cissoides Wall.; Walp. Repert. II. p. 194.

Gynostemma cissoides Benth. et Hook. fil. Gen. Pl. I. p. 839; Franch. et Sav. Enum. Pl. Jap. I. p. 176, et II. p. 316.

Enkylia digyna Griff.

Enkylia trigyna Griff.; Miq. Prol. Fl. Jap. pp. 15, 142.

Gynostemma pedatum Blume Bijdr. p. 23 (1825); Spreng. Syst. Veg. IV. 2, p. 251; Walp. Repert. I. p. 98; Benth. et Hook. fil. Gen. Pl. I. p. 839; Clarke in Hook. fil. Fl. Brit. Ind. II. p. 633, excl. syn. nonnul. Franch. Pl. David. I. p. 136; Cogn. in DC. Monogr. Phanerog. III. p. 913; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 320; Muell. et Pax in Engl. et Prantl Fl.-Fam. IV. 5, p. 37; O. Kuntze Rev. Gen. Pl. I. p. 256; Ito et Matsum. Tent. Fl. Lutch. I. p. 251; Diels in Engler's Bot. Jahrb. XXIX. p. 604.

Pestatozzia pedata Zoll. et Moritz.; Walp. Ann. I. p. 316.

Zanonia pedata Miq. Fl. Ind. Bat. I. p. 683.

Vitis atroviridis Wall.

Vitis trichophora Wall.

Nom. Jap. *Amacha-dzuru*.

Hab. Japan, widely distributed.

Bucus liukiensis Makino.

Bucus sempervivens var. *liukiensis* Makino in Bot. Mag., Tokyo, IX. (1895) p. 279, et XV. (1901) p. 169.

Hab. Loochoo (*Y. Tashiro!* *H. Kuroiwa!*).

Chloranthus brachystachyus Blume Fl. Jav., Chloranth. (1828) p. 13, tab. 2; Miq. Fl. Ind. Bat. I. p. 801, Ann. Mus. Bot. Lugd.-Bat. III. p. 129, Prol. Fl. Jap. p. 293, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 83; Zolling. Syst. Verz. Ind. Archip. I. p. 83; Hoffm. et Schult. Nom. indig. Pl. Jap. p. 27, et ed. nov. p. 14; Benth. Fl. Hongk. p. 334;

Solms in DC. Prodr. XVI. 1, p. 475; Franch. et Sav. Enum. Pl. Jap. I. p. 444; Maxim. in Bull. Soc. Nat. Mosc. (1879) p. 56; Engler in Engler's Bot. Jahrb. VI. p. 55; Hook. fl. Fl. Brit. Ind. V. p. 100; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 367; Henry in Trans. Asiat. Soc. Jap., Suppl. p. 78; Diels in Engler's Bot. Jahrb. XXIX. p. 272.

Nigrina brachystachys Makino ined.

Chloranthus ilicifolius Blume in herb. ex Miq. Ann. Mus. Bot. Lugd.-Bat. III. p. 129, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 177.

Chloranthus montanus Sieb. herb. ex Miq. Ann. Mus. Bot. Lugd.-Bat. III. p. 129.

Chloranthus ceylanicus Miq. Fl. Ind. Bat. I. p. 802.

Ascarina serrata Blume.

Sarcandra chloranthoides Gardn.; Wight Ic. Pl. Ind. Orient. tab. 1946.

Chloranthus denticulatus Cordem.

Chloranthus monander R. Br. in Bot. Mag. tab. 2190, in nota.

Nom. Jap. *Senryō*.

Hab. Southern Japan.

Chloranthus spicatus (Thunb.) Makino nom. nov.

Nigrina spicata Thunb. Fl. Jap. (1784) p. 65; Lam. Encycl. méth. Bot. IV. p. 489; Dryand. in Trans. Linn. Soc. II. (1794) p. 221.

Nigrina spicifera Lam. Illustr. I. (1791) p. 295, n. 1506, tab. (1823) 71.

Chloranthus inconspicuus Swartz (1787); Dryand. in Trans. Linn. Soc. II. (1794) p. 221; Willd. Sp. Pl. I. (1797) p. 688; Pers. Syn. Pl. I. (1805) p. 148; Ait. Hort. Kew. ed. 2, I. (1810) p. 270; Roem. et Schult. Syst. Veg. III. (1818) p. 461; Spreng. Syst. Veg. III. (1826) p. 750; Roxb. Fl. Ind. I. (1832) p. 438; Sieb. et Zucc. in Abhandl. Akad. Münch. IV. 3, (1846) p. 232; Zolling. Syst. Verz. Ind. Archip. I. (1854) p. 83; Schnizl. Iconogr. Fam. Nat. tab. 80, fig. 8-15; Hoffm. et Schult. Nom. indig. Pl. Jap. p. 27, et ed. nov. p. 14; Benth. Fl. Hongk. p. 334; Miq. Fl. Ind. Bat. I. p. 802; Ann. Mus. Bot. Lugd.-Bat. III. p. 129, Prol. Fl. Jap. p. 293, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 83; Solms in DC. Prodr. XVI. 1, p. 474; Maxim. in Bull. Soc. Nat. Mosc. (1879) p. 56; Franch. et Sav. Enum. Pl. Jap. I. p. 443; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 368; Bretschn. Hist. Eur. Bot. Disc. in China pp. 127, 147, 244, et 490.

Creodus odorifer Lour. Fl. Cochinch. (1790) p. 89, et ed. Willd. p. 112.

Chloranthus indicus Wight Ic. Pl. Ind. Orient. tab. 1945.

Nom. Jap. *Charan*.

Hab. Japan, cultivated.

Chloranthus serratus (Thunb.) Roem. et Schult. Syst. Veg. III (1818) p. 461; Spreng. Syst. Veg. III. (1826) p. 750; Sieb. et Zucc. in Abhandl. Akad. Münch. IV. 3, p. 232; Zolling. Syst. Verz. Ind. Archip. I. p. 83; Hoffm. et Schult. Nom. indig. Pl. Jap. p. 27, et ed. nov. p. 14; Solms in DC. Prodr. XVI. 1, p. 475; Miq. Fl. Ind. Bat. I. p. 802, Ann. Mus. Bot. Lugd.-Bat. II. p. 201, III. p. 129, Prol. Fl. Jap. pp. 133, 293, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 83; A. Gray Bot. Jap. in Mem. Amer. Acad. n. s. VI. p. 405; Franch. et Sav. Enum. Pl. Jap. I. p. 444; Maxim. in Bull. Soc. Nat. Mosc. (1879) p. 56; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 369; Diels in Engler's Bot. Jahrb. XXIX. p. 273.

Nigrina serrata Thunb. (1815).

Nigrina spicata H. Bog. ex Zolling. Syst. Verz. Ind. Archip. I. (1854) p. 83.

Chloranthus japonicus Sieb. herb. ex Miq. Ann. Mus. Bot. Lugd.-Bat. III. p. 129.

Chloranthus inconspicuus β . *japonica* Sieb. Ann. Soc. Hort. Pays-Bas, (1844) p. 26, ex Sieb. et Zucc. Abh. Akad. Muench. IV. 3, p. 232.

Chloranthus quadrifolius A. Gray herb. ex Miq. Ann. Mus. Bot. Lugd.-Bat. III. p. 129.

Chloranthus Blumeanus Cordem.

Futali Situka Thunb. Fl. Jap. Pl. Obs. n. 79.

Nom. Jap. *Futari-shidzuka*.

Hab. Japan, widely distributed.

Chloranthus Oldhami Solms in DC. Prodr. XVI. 1. (1869) p. 476; Maxim. in Bull. Soc. Nat. Mosc. (1879) p. 56; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 369; Henry in Trans. Asiat. Soc. Jap., Suppl. p. 78; Bretschn. Hist. Eur. Bot. Disc. in China p. 687.

Nigrina Oldhami Makino inedit.

Hab. Formosa.

Chloranthus japonicus Sieb. (1829); Solms in DC. Prodr. XVI. 1, p. 476; Hance in Journ. Bot. (1878) p. 14; Maxim. in Bull. Soc. Nat. Mosc. (1879) p. 57; Franch. et Sav. Enum. Pl. Jap. I. p. 444; Franch. Pl. David. I. p. 258; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 368; Korsh. in Act. Hort. Petrop. XII. p. 348; Diels in Engler's Bot. Jahrb. XXIX. p. 273.

Nigrina japonica Makino inedit.

Tricercandra quadrifolia A. Gray in Perry's Exped. Jap. II. (1857) p. 318, et in Mem. Amer. Acad. n. s. VI. (1859) p. 405; Miq. in Ann. Mus. Bot. Lugd.-Bat. III. p. 130, et Prol. Fl. Jap. p. 294.

Chloranthus serratus var. *quadrifolia* Miq. Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. (1870) p. 83.

Chloranthus japonicus β . *minor* Sieb. herb. ex Miq. Ann. Mus. Bot. Lugd.-Bat. III. p. 130.

Chloranthus macranthera Schult. fil. in herb. ex Miq. Ann. Mus. Bot. Lugd.-Bat. III. p. 130.

Chloranthus monostachyus Hoffm. et Schult. Nom. indig. Pl. Jap. (1853) p. 27, et ed. nov. (1864) p. 14, non R. Br.

Chloranthus mandshuricus Rupr. Dec. Pl. Amur. tab. 2; Maxim Prim. Fl. Amur. p. 463; Regel Tent. Fl. Ussur. p. 151; Bretschn. Hist. Eur. Bot. Disc. in China p. 615.

Nom. Jap. *Hitori-shidzuka*.

Hab. Japan, widely distributed.

Akebia quinata Decne. forma **viridiflora** Makino.

Peduncle and pedicels viridescens; scaly bracts pale. Male flower: sepals yellowish-viridescens; stamens pale; rudimentary ovaries pale. Female flower: sepals similar to those of the male flower in colour; ovaries about 9-12, viridescens; stigma truncate, minutely concave; rudimentary stamens yellowish. Fl. April.

Nom. Jap. *Awo-akebi* (nov.).

Hab. Prov. OWARI: Nagoya, cult. (*T. Makino!* April 1902, from the garden of Y. Kume).

Sisymbrium (Velarum) **officinale** Scop.; Smith Engl. Bot. tab. 725; Lam. et DC. Fl. Fr. ed. 3, IV. p. 672; DC. Syst. II. p. 459, et Prodr

I. p. 191; Spreng. Syst. Veg. II. p. 902; Ait. Hort. Kew. ed. 2, IV. p. 111; Torr. et Gray Fl. N. Amer. I. p. 91; Nyman Syl. Fl. Europ. p. 195; Berg Charakt. Pfl.-Gatt. ed. 2, p. 99, tab. 84, fig. 603; C. Koch in Linnæa, XV. p. 253; Ledeb. Fl. Ross. I. p. 176; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 41; A. Gray Man. Bot. ed. 5, p. 70; Wood Cl.-Book Bot. p. 233; Chapm. Fl. S. Un. St. p. 28; Hook. fil. Stud. Fl. Brit. Isl. ed. 2, p. 28; Benth. Fl. Austral. I. p. 72, et Brit. Fl. ed. 5, p. 33; Walp. Repert. I. pp. 163, 167, et Ann. VII. p. 134; Korshins. in Act. Hort. Petrop. XII. p. 308; Robins. in Gray et Wats. Synopt. Fl. N. Amer. I. 1, p. 137; Prantl in Engl. et Prantl Pfl.-Fam. III. 2, p. 170.

Erysimum officinale Linn. Sp. Pl. p. 660, Cod. n. 4804; Houtt. Nat. Hist. XXVII. p. 684; Willd. Sp. Pl. III. p. 509; Pers. Syn. Pl. II. p. 199; Berg Pharm. Bot. (1860) p. 399.

Chamæplium officinale Wallr.

Klukia officinalis Andrz. Cruc. ined. ex DC. Syst. II. p. 460.

Sisymbrium officinarum Crantz.

Erysimum runcinatum Gilib.

Nom. Jap. *Kakine-garashi* (nom. nov.).

Hab. Prov. MŪRSU : Yokohama-mura in Kamikita-gōri (Y. Yamasaki ! August 1902).

New to the Flora of Japan.

Lycopodium alpinum Linn. Sp. Pl. p. 1104, Cod. no. 7974; Houtt. Nat. Hist. XXXII. p. 376; Swartz Syn. Fil. p. 178; Willd. Sp. Pl. V. p. 20; Schk. Krypt. Gew. p. 162, tab. 161; Ait. Hort. Kew. ed. 2, V. p. 493; Lam. Encycl. Bot. III. p. 647; Spreng. Syst. Veg. IV. p. 14. Less. in Linnæa, IX. p. 212; Ledeb. Fl. Alt. IV. p. 323, et Fl. Ross. IV. p. 498; Lam. et DC. Fl. Franc. ed. 3, II. p. 572; Kaulf. Enum. Fil. p. 11; Michx. Fl. Bor. Amer. II. p. 282; Hook. Fl. Bor.-Am. II. p. 268; Id. Brit. Ferns, tab. 53; Hook. et Grev. Enum. Fil. n. 91, in Hook. Bot. Misc. II. p. 380; Spring Monogr. Lycopod. I. p. 104, et II. p. 48; Nyman Syl. Fl. Eur. p. 435; Regel et Til. Fl. Ajan. p. 127; Milde Fil. Eur. et Atl. p. 258; Koch Syn. Fl. Germ. et Helv. ed. 3, tab. 727; Benth. Handb. Brit. Fl. ed. 5, p. 546; Hook. fil. Stud. Fl. Brit. Isl. ed. 2, p. 503; Baker Handb. Fern-Allies, p. 27; Makino in Bot. Mag., Tokyo, XII. (1898) p. 304.

Stachygynandrum alpinum Presl.

Lycopodium complanatum var. *alpinum* Spring.

Lycopodium chamarensense Turcz. in herb. Hook. ex Spring Monogr. Lycopod. II. p. 48.

Lycopodium cupressifolium Opiz.

Lycopodium sitchense Rupr.; Ledeb. Fl. Ross. IV. p. 499.

Lycopodium alpinum var. *sitchense* Milde l. c.

Nom. Jap. *Miyama-hikagekadzura* (J. Matsumura).

Hab. Prov. Etchū : Mt. Tateyama (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 24, 1884).

This occurs rarely on alpine mountains in Japan, while the var. *nikoense* Franch. et Sav. is met with more commonly.

var. nikoense Franch. et Sav. Enum. Pl. Jap. II. p. 613; Baker Handb. Fern-Allies, p. 27; Makino in Bot. Mag., Tokyo, XII. p. 303.

Lycopodium nikoense Franch. et Sav. l. c. p. 198.

Nom. Jap. *Takane-hikagekadzura* (T. Makino).

Hab. Prov. Etchū : Mt. Tateyama (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 24, 1884); Prov. SHIMOTSUKE: Mt. Shirane in Nikkō (Herb. ibid. Aug. 28, 1884); Prov. UZEN: Mt. Gassan (*R. Yatabe* and *S. Ōkubo!* herb. ibid. July 23, 1887); Prov. RIKUCHŪ: Mt. Kurikoma (*T. Makino!* Aug. 1890); Prov. SHINANO: Mt. Ondake (*K. Yazawa!* Aug. 21, 1893).

Lycopodium inundatum Linn. Sp. Pl. p. 1102, Codex no. 7967; Houtt. Nat. Hist. XXXII. p. 372; Swartz Syn. Fil. p. 177; Willd. Sp. Pl. V. p. 25; Schk. Krypt. Gew. p. 161, tab. 160; Ait. Hort. Kew. ed. 2, V. p. 494; Lam. Encycl. méth. Bot. III. p. 648; Spreng. Syst. Veg. IV. p. 15; Lam. et DC. Fl. Franc. ed. 3, II. p. 574; Klotzsch in Linnæa, XVIII. p. 519; Michx. Fl. Bor. Amer. II. p. 283; Hook. et Grev. Enum. Fil. in Hook. Bot. Misc. II. p. 372; Hook. Fl. Bor.-Amer. II. p. 267; Id. Brit. Ferns, tab. 51; Spring Monogr. Lycopod. I. p. 74, et II. p. 33; Ledeb. Fl. Ross. IV. p. 497; Metten. Fil. Hort. Bot. Lips. p. 122; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 727; Nyman. Syl. Fl. Eur. p. 436; Milde Fil. Eur. et Atl. p. 256; A. Gray Man. Bot. ed. 5, p. 673; Wood Cl.-Book Bot. p. 812; Benth. Handb. Brit. Fl. ed. 5, p. 546; Hook. fil. Stud. Fl. Brit. Isl. ed. 2, p. 503; Baker Handb. Fern-Allies p. 18; Christ in Bull. Herb. Boiss. IV. (1896) p. 675; Makino in Bot. Mag., Tokyo, XIV. p. 84.

Plananthus inundatus Beauv.

Lycopodium palustre Lam.

Lycopodium alopecuroides Zouyef. non Linn.

Lepidotis incurva Opiz.

Nom. Jap. *Yachi-sugiran*.

Hab. Prov. ISHIKARI in Hokkaidō : Tsuishikari in Sapporo-gōri (*K. Miyabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 22, 1895); Prov. SHINANO : Mt. Togakushi (*K. Usui!* Aug. 1899 ; *K. Tanaka!* 1901, 1902).

Rare in Japan.

***Lycopodium Selago* Linn. var. *Miyoshianum* Makino.**

Lycopodium Miyoshianum Makino in Bot. Mag., Tokyo, XII. (1898 p. 36.

Nom. Jap. *Hime-sugiran* (M. Miyoshi).

Hab. Japan, widely but paringly distributed.

***Nervilia punctata* (Blume) Makino nom. nov.**

Pogonia punctata Blume Mus. Bot. Lugd.-Bat. I. p. 32 ; et Coll. Orchid. Archip. Ind. et Jap. (Fl. Jav. IV.) p. 150, tab. 49, fig. 2, A-C, et tab. 54, fig. B ; Reichb. fil. in Walp. Ann. III. p. 600 ; Makino in Bot. Mag., Tokyo, III. (1889) p. 448.

Nom. Jap. *Mukago-saishin*.

Hab. Japan.

I cannot yet examine any specimen of this plant, but I have two pictures drawn about fifty years ago by the Japanese from living plants growing in this country; one of which is drawn from that found at Somei near Tokyo, the other by Yokusai Iinuma, the author of the well-known Sōmoku-Dzusetsu.

***Nervilia Aragoana* Gaud. (1826).**

Pogonia Nervilia Blume Mus. Bot. Lugd.-Bat. I. p. 32, et Coll. Orchid. Archip. Ind. et Jap. (Fl. Jav. IV.) p. 154, tab. 56, fig. 2, A-B, 1-14 ; Reichb. fil. in Walp. Ann. III. p. 600.

Pogonia flabelliformis Lindl. ; Id. in Journ. Linn. Soc. III. p. 45 ;

Hook. fil. Fl. Brit. Ind. VI. p. 121; Makino in Bot. Mag., Tokyo, X. p. 56.

Pogonia carinata Wight Ic. Pl. Ind. Orient. tab. 1720, non Lindl.

Nom. Jap. *Aoi-bokuro*, *yaeyama-kumagaesō*.

Hab. LOOCHOO: Isl. Nishiomote in Yaeyama Archip. (*Y. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1887), Shuri in Isl. Okinawa (*H. Kuroiwa!* Nov. 1892).

Gastrodia gracilis Blume Mus. Bot. Lugd.-Bat. II. p. 174, et Coll. Orchid. Archip. Ind. et Jap. (Fl. Jav. IV.) p. 142, tab. 53, fig. 2, et tab. 54, fig. D.

Nom. Jap. *Hime-temma*, *shiro-temma*.

Hab. PROV. YAMATO: Inosako in Sei, Munchi-mura, Yoshino-gōri (*K. Tsuzi!* July 23, 1902).

Rare.

Saxifraga (*Trachyphyllum*) ***Merkii*** Fisch. (1822); Spreng. Syst. II. p. 366; Seringe in DC. Prodr. IV. p. 24; Chamisso in Linnæa, VI. p. 556; Ledeb. Fl. Ross. II. p. 208; Engl. Monogr. Gatt. Saxifr. p. 208; Id. in Engl. et Prantl Pfl.-Fam. III. 2 a, p. 57; Miyabe Fl. Kurile Isl. p. 233.

Saxifraga myosotifolia Don in Trans. Linn. Soc. XIII. (1822) p. 373; Ser. in DC. Prodr. IV. p. 45.

Saxifraga helianthemifolia Willd. herb. 8442, ex Ledeb. Fl. Ross. II. p. 208.

var. *Idzurœi* Engler ex Maxim. in litt. ex Matsum. Cat. Pl. Herb. Coll. Sc. Imp. Univ. Tokyo, (1886) Correct. p. 3; Makino in Bot. Mag., Tokyo, XII. p. 400.

Saxifraga Idzurœi Franch. et Sav. Enum. Pl. Jap. II. p. 353; Matsum. l. c. p. 64.

Nom. Jap. *Kumoma-gusa*.

Hab. PROV. SHINANO: Mt. Ondake (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 28, 1880; *K. Yazawa!* Aug. 1893; *K. Tanaka!* Aug. 1902), Mt. Shirouma-dake (*M. Orii!* Aug. 1902).

Saxifraga (*Trachyphyllum*) **bronchialis** Lion. Sp. Pl. p. 400, Codex no. 3147; Houtt. Nat. Hist. XXVI. p. 457; Willd. Sp. Pl. II. p. 644; Poir. Encycl. méth. Bot. VI. p. 679; Don in Trans. Linn. Soc. XIII. p. 376; Spreng. Syst. Veg. II. p. 364; Ser. in DC. Prodr. IV. p. 47; Chamisso in Linnæa, VI. p. 555; Ledeb. Fl. Alt. II. p. 124, in nota, et Fl. Ross. II. p. 207; Hook. Fl. Bor.-Am. I. p. 254; Hook. et Arn. Bot. Beechey's Voy. p. 124; Torr. et Gray Fl. N. Am. I. p. 564; Nyman Syl. Fl. Fur. p. 254; Maxim. Prim. Fl. Amur. p. 119; Regel Tent. Fl. Ussur. p. 71; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 43; Engler Monogr. Gatt. Saxifr. p. 215; Id. in Engl. et Prantl Pfl.-Fam. III. 2 a, p. 58; Walp. Ann. VII. p. 891; Miyabe Fl. Kuril. Isl. p. 233; Korsh. in Act. Hort. Petrop. XII. p. 341; H. de Boiss. in Bull. Herb. Boiss. V. p. 686; Makino in Bot. Mag., Tokyo, XII. p. 400.

Ciliaria bronchialis Haw.

Saxifraga spinulosa Adams; Ser. in DC. Prodr. IV. p. 47.

Saxifraga congesta Willd. herb. 8434, ex Ledeb. Fl. Ross. II. p. 207.

Saxifraga foliis imbricatis,.....Gmel. Fl. Sib. IV. p. 164, tab. 65, fig. 2.

Nom. Jap. *Shikotan-sō* (K. Miyabe).

Hab. Prov. CHISHIMA in Hokkaidō: Isl. Shikotan (*K. Miyabe!* July 27, 1884); Prov. SHINANO: Mt. Yatsuga-dake (*K. Tanaka!* Aug. 1902), Mt. Shirouma-dake (*M. Orii!* Aug. 1902).

var. pseudo-burseriana Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 133.

Saxifraga pseudo-burseriana Fisch. in litt. ex Chamisso in Linnæa, VI. (1831) p. 555; Torr. et Gray Fl. N. Am. I. (1838-40) p. 565; Walp. Repert. II. p. 365.

Saxifraga nova species Chamisso in Linnæa VI. p. 555.

Saxifraga bronchialis var. *cherlerioides* Makino in Bot. Mag., Tokyo, XII. p. 400, non Engl.

Nom. Jap. *Hime-kumomagusa* (J. Matsumura).

Hab. Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 12, 1884; *H. Hattori!* Aug. 15, 1897; *K. Tanaka!* 1902).

Saxifraga (*Diptera*) **cortusæfolia** Sieb. et Zucc. **var. partita** Makino nov. var.

Leaves reniform-orbicular in outline, broadly cordate at the base, deeply partite with narrow sinuses; lobes 5, oblong-lanceolate, shortly acuminate, incised, 3-nerved, the middle lobe larger.

Nom. Jap. *Kaede-daimozisō*.

Hab. Prov. ECHIZEN: Mt. Takekurabe-yama (*Y. Yoshinaga!* July 1893).

Sciaphila (*Hyalisma*) **japonica** Makino sp. nov.—TRIURIDACEÆ.

Monœcious, leafless, subhyaline, very small, perennial(?), about 3–5 cm. high, glabrous, purple. Rhizome subterranean, delicate, oblique or suberect, white, remotely with a few minute deltoid-subulate scales; roots fibrous, filiform, short, pauci-fasciculate, villosulate with very fine white hairs, white or whitish. Stem erect, delicate, straight, often irregularly flexuous at the base, simple, sometimes laxly branched, distantly with small subulate acuminate scales which are adpressed to the stem, purple, but pale towards the base. Raceme terminal, simple, erect, about 5–12 mm. long, laxly and alternately about 4–15-flowered, male above and female below; rachis straight or subflexuous, delicate; bract situated at each base of pedicels, linear-lanceolate, acuminate, concave, membranaceous, shorter than the pedicel, brown. Flowers minute, pedicellate; pedicels erect-patent, or sometimes patulous in the superior ones, capillary, longer than the flowers, attaining about $3\frac{1}{2}$ mm. in length, purple. Male flower 2 mm. across, deciduous leaving the pedicels. Perianth deeply 6-parted, patent then reflexed, membranaceous, hyaline, celluloso-bullate, glabrous, valvate in bud, purplish brown; lobes ovato-lanceolate, scarcely smaller in 3 alternate ones, entire, acuminate, but caudato-acuminate in 3 alternate smaller ones, the tips glabrous and inflexed in bud. Stamens 3, opposite to perianth-lobes; anther sessile, approximate, depressed, roundish, extrorse, 2-celled and confluent, transversely dehiscent, pale-yellow; pistillodes 3, opposite to the anthers, erect, subulato-linear, longer than the anther. Female flower about $1\frac{1}{2}$ mm. across. Perianth 6- (sometimes 7-) parted, patent then reflexed, thinly membranaceous, hyaline, celluloso-bullate, glabrous, persistent, valvate in bud, purplish brown; lobes ovate, acute, entire, glabrous. Ovaries numerous, densely aggregate into a semi-globule provided with radiated conspicuous styles, sessile on the elevated round receptacle, very minute, obovoid, glabrous, 1-celled, purple; ovule solitary, erect; style ventral, inserted to the supra-medium, elongate and much longer than the ovary, filiform, glabrous, bullate, about $\frac{2}{3}$ mm. long, brown; stigma simple,

acute. Carpels numerous, conglomerate into a globose head (about $1\frac{1}{2}$ mm. in diameter) accompanied by the persistent perianth below as well as persistent long and manifest ventral styles, sessile on a central receptacle, obovoid, slightly oblique in form, about $\frac{2}{3}$ mm. long; pericarp thin, cellular-verruculose, but irregularly rugulose when dried, purplish brown and then turned to whitish when fully matured and dried. Seed solitary, obovoid, slightly oblique in form, erect.

Nom. Jap. *Hongō-sō* (nom. nov.).

Hab. Prov. ISE: Hongō in Kusu-mura, Miye-gōri (*K. Teraoka*, *K. Imai*, and *Y. Uyematsu*! Sept. 7, 1902).

This species is the sole representative of *Triuridaceae* in Japan, found growing densely among fallen leaves in the shelter of forest trees in temperate region of this country; while the foreign species are all tropical. It resembles *Sciaphila nana* Bl. of Java. I have the specimens of this rare and singular species both in flowers and in fruits, through the kindness of MM. S. Nohara and Z. Umemura.

***Balanophora japonica* Makino sp. nov.**

Balanophora dioica Ito in Journ. Linn. Soc. XXIV. (1887) tab. 5, fig. 5-6 (non bona), excl. fig. 7-8.

Dioecious. Rhizome hypogæous, tuberous, deeply ramose into globular thick volvas (the margin of the mouth of the volvas cleft into few short deltoid lobes), about 1-9 cm. across, light yellowish brown, rough on surface and laxly pastular; pastules whitish, simply stellato-lobed. Peduncle one to each volva of rhizome, erect, stout, terete, straight, smooth, varies in length and longest one about 7 cm., but sometimes very short, about $\frac{1}{2}$ - $1\frac{1}{2}$ cm. in diameter, reddish orange; scales large, imbricated concealing the peduncle or laxly imbricated, erect or erect-patulous, sparse or sometimes subopposite, ovato-orbicular, ovate, or ovato-elliptical, sometimes ovato-oblong, rounded-obtuse, entire, concave, smooth, attaining about 3 cm. long, 2 cm. wide, similar to the peduncle in colour. Head erect, elliptical-ovoid to cylindrical-ovoid, or sometimes globular-ovoid, $1\frac{1}{2}$ -5 cm. long, $1\frac{1}{4}$ - $3\frac{1}{2}$ cm. across, deep red, very rarely yellowish red (in the *Nikkō* form), densely covered with flowers and bracts. Female flowers exceedingly numerous, very minute, very dense, inserted in the head and at the base of pedicellate bracts which are intermixed with them, pedicellate, yellow; ovary ellipsoidal; style filiform, double or triple as long as the ovary; pedicel shorter or longer than the ovary; bracts with a short and stout pedicel, obovoid-globose, somewhat concave at

the top, usually longer than the flower, red. Flowers in October-December.

Nom. Jap. *Tsuchi-torimochi*, *tsuchi-yamamochi*, *tsuchi-mochi*, *yamadera-bōzu*, *shōzyō-dake*.

Hab. Prov. TOSA (*T. Makino*!, *T. Yoshinaga*!, *I. Nakamura*!, *M. Fudzita*!); Prov. IDZU (*S. Ōkubo*!); Prov. HIGO (*M. Murakami*!, *T. Kawakami*!); Prov. HYŪGA (*Y. Tanaka*); Prov. ETCHŪ (*T. Mayeda*); Prov. SHIMOTSUKE (*T. Uchiyama*!); Amami-Ōshima (*T. Uchiyama*!).

A species closely allied to *Balanophora dioica* R. Br.; it may be probably identical with that species, but I was not able to fix the question definitely, on account of the want of the specimens of *B. dioica* R. Br. Parasitic on the roots of *Symplocos lancifolia* Sieb. et Zucc., *S. prunifolia* Sieb. et Zucc., and *S. japonica* A. DC., in shady forests. Male plants unknown. Bird-lime is made from the tuberous rhizome.

I have not yet seen this species from Loochoo, where another species (*Balanophora Kuroiwai* Makino ined.) was found by Mr. H. Kuroiwa.

Sedum (*Seda genuina*) **senanense** Makino sp. nov.

Perennial, glabrous. Stems creeping, terete, branched, rooting, dark-purple or darkish reddish; flowering stem terminal and lateral, erect or ascending, slender, terete, usually simple or sometimes very laxly branched, leafy throughout, attaining about 9 cm. in height. Leaves sparse, erect-patent or spreading, loosely disposed on the flowering stem but densely imbricated in the sterile shoots, narrowly oblong to linear, or linear-subspathulate, obtuse, truncate and very minutely auriculate at the base, semiterete, succulent, $1\frac{1}{2}$ -8 mm. long, green and usually tinged with red beneath. Cyme about $1-2\frac{1}{2}$ cm. across, provided with 1 to 3 branches; branches spreading, not long, delicate, slightly flexuous, approximately and secundly 1-5-flowered; bracts similar to leaves in form, but usually smaller. Flower very shortly pedicellate, 6-8 mm. across, yellow. Sepals 5, subunequal, lanceolate-oblong, obtuse, succulent, minutely auriculate at base, longitudinally 3-veined, about 3- nearly 4 mm. long, persistent. Petals 5, spreading, longer than the sepals, ovato-lanceolate, acuminate, attenuated at the lower portion as if form a broad claw, thin, $4-4\frac{1}{2}$ mm. long, the midrib delicate, the lateral veins one on each side and soon disappear before reaching the margin. Stamens 10, evidently shorter than the petals, equal in length, the oppositipetalous ones inserted on the lower portion of the petals; filament subulato-filiform; anther minute, elliptical,

red; pollen yellow. Hypogynous scales minute, linear-rectangular, truncate. Ovaries 5, erect-patent, shorter than the petals, slightly connate at the base, ovato-lanceolate, tapering towards the short and straight style; stigma punctiform; ovules 9-14, cylindrical-oblong. Follicles 5, horizontally patent, narrowly ovate, rather abruptly attenuated at the apex, with the persistent style, the ventral appendages evident; carpel thin. Seeds 9-14, cylindrical-oblong, very minutely granulato-rugulose under microscope, shaded with very light lead-colour, about $\frac{3}{8}$ mm. long. Flowers in July-August.

Hab. Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 12, 1884; *H. Hattori!* Aug. 1897; *S. Hara!* Aug. 2, 1901), Mt. Shirouma (*M. Ori!* Aug. 1902), Mt. Yatsugadake (*K. Tanaka!* Aug. 1902).

This alpine species is very closely allied to *Sedum japonicum* Sieb., having much smaller leaves and more delicate stems. Leaves are usually beautifully tinged with red, and the red colour is manifest on the under surface. It grows abundantly in rocky places on alpine mountains.

Cotyledon malacophylla Pall.; Makino in Bot. Mag., Tokyo, XV. (1901) p. 143.

Stolons short, hypogæous, or subhypogæous. Leaves usually green, but sometimes glaucous! or subglaucous!

This species grows abundantly on littoral rocks on the coast near Hachinohe in the province of Mutsu, where their leaves are green, glaucous, or subglaucous in colour. Last year, I have described in this Magazine (l. c.) their leaves as "not cæsious or not glaucous" but this was not correct.

var. Bœhmeri Makino nov. var.

Cotyledon Bœhmeri Makino in herb. Sc. Coll. Imp. Univ. Tokyo.

Rosettes about 3-6 cm. across, emitting several or many stolons among the leaves. Stolons axillary, radiately spreading, elongate, attaining about 6 cm. or more long, about 1-3 mm. across, fleshy, pale green, glabrous, furnished with few opposite small leaves, and also with a small crown of sparse and approximate leaves at the end. Leaves spreading or erect-patent, rosulate, succulent, glabrous, light green, concolorous, obovato-spathulate or elliptical-spathulate, acute at the apex, shortly and slightly narrowed at the base, acute and smooth-edged, more or less concave on

the upper surface, attaining about $3\frac{1}{2}$ cm. long, $2\frac{1}{4}$ cm. broad; nerves immersed and invisible superficially. Flower as in the type.

Nom. Jap. *Tatsugashira*, *komochi-rence*.

Hab. Hokkaidō (*L. Bæhmer!* herb. Sc. Coll. Imp. Univ. Tokyo, sub nom. *Tatsugashira*); Prov. MUSASHI: Tokyo, cult. (*T. Makino!* 1902).

The locality of Tokyo, which was referred under *Cotyledon malacophylla* Pall. in this Magazine, XV. p. 144, should be properly situated under this variety. It is sometimes cultivated in Tokyo.

Hippuris vulgaris Linn. Sp. Pl. p. 4, Cod. n. 29; Houtt. Nat. Hist. XXV. p. 57; Willd. Sp. Pl. I. p. 26; Pers. Syn. Pl. I. p. 5; Spreng. Syst. Veg. I. p. 19; Ait. Hort. Kew. ed. 2, I. p. 13; Chamiss. in Linnæa IV. p. 506; Michx. Fl. Bor. Amer. I. p. 1; Sow. Engl. Bot. tab. 516; Roem. et Schult. Syst. Veg. I. p. 41; Hook. Fl. Bor.-Amer. I. p. 217; Torr. et Gray. Fl. N. Amer. I. p. 531; DC. Prodr. III. p. 71; Nyman Syll. Fl. Eur. p. 264; Ledeb. Fl. Alt. I. p. 7; Id. Fl. Ross II. p. 119; Regel et Til. Fl. Ajan. p. 88; Maxim. Ind. Fl. Pek. in Prim. Fl. Amur. p. 471; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 42; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 211; Benth. Handb. Brit. Fl. ed. 5, p. 175; A. Gray Man. Bot. ed. 5, p. 176; Wood Cl.-Book Bot. p. 358; Hook. fil. Stud. Fl. Brit. Isl. ed. 2, p. 147; Clarke in Hook. fil. Fl. Brit. Ind. II. p. 432; Kuntze Rev. Gen. Pl. I. p. 234; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 292.

Limnopoëce vulgaris Scop.

Hippuris palustris Gorter.

Equisetum palustre Erndt.

Hippuris verticillata Gilib.

Hab. Prov. KUSHIRO: Hamanaka (*K. Miyabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 4, 1884); Prov. ISHIKARI: Sapporo (Herb. *!* *ibid.*); Prov. OSHIMA: Fukushima (*K. Miyabe* and *Y. Tokubuchi!* herb. *ibid.* July 17, 1890); Prov. SHINANO: Shiokawa in Hino-mura, Kamitakai-gōri (*K. Tanaka!* Nov. 1902).

In Hondō this species is found very uncommonly.

Comanthosphace japonica (Miq.) S. Moore in Journ. Bot. (1877) p. 293; Hook. fil. in Bot. Mag. tab. 7463.

Elsholtzia japonica Miq. Prol. Fl. Jap. p. 35; Franch. et Sav. Enum. Pl. Jap. I. p. 364.

Pogostemon japonicus Benth. in Benth. et Hook. fil. Gen. Pl. II. p. 1180.

Elsholtzia sublancoolata Miq. l. c.; Franch. et Sav. l. c.

Comanthosphace sublancoolata S. Moore l. c.

Hab. Prov. SHIMOTSUKE: Imaichi (*K. Sawada!* herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 25, 1879, *typica!*); Prov. ISE: Komono (Herb. *!* *ibid.* Aug. 6, 1883); Prov. HITACHI: Mt Tsukuba (*C. Ōwatori!* herb. *ibid.* Sept. 2, 1895); Prov. ISHIKARI in Hokkaidō: Sapporo (*Y. Tokubuchi!* herb. *ibid.* Sept. 4, 1889); Prov. SURUGA: Mt. Fuzi (*T. Makino!* Aug. 17, 1899); Prov. TOSA (*T. Makino!*); Prov. IYO: Mt. Nakatsumyōzin (*K. Okudaira!* Aug. 7, 1896).

var. barbinervis (Miq.) Makino.

Elsholtzia barbinervis Miq. l. c. p. 36.

Comanthosphace barbinervis S. Moore l. c.

Hab. Prov. SURUGA: Mt. Fuzi (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 25, 1881); Prov. TOSA: Mt. Tebako (*T. Makino!* Aug. 1885; *R. Yatabe!* herb. *ibid.* Aug. 8, 1888; *S. Yano!* herb. *ibid.* Aug. 10, 1890); Prov. MUSASHI: Bot. Gard. Koishikawa in Tokyo, cult. (*T. Makino!* herb. *ibid.* Oct. 1893).

Comanthosphace stellipila (Miq.) S. Moore in Journ. Bot. (1877) p. 293.

Elsholtzia stellipila Miq. Prol. Pl. Jap. p. 35; Franch. et Sav. Enum. Pl. Jap. I. p. 363.

Hab. Prov. TOSA: Sakawa, cult. (*T. Makino!*); Prov. YAMATO: Kasuga-yama (*J. Matsumura* and *S. Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, July 15, 1883); Prov. YAMASHIRO: Mt. Takao (*T. Makino!* Nov. 7, 1893), Mt. Hiei (*K. Tsuzi!* Oct. 8, 1900); Prov. MUSASHI: Bot. Gard. Koishikawa in Tokyo, cult. (Herb. *!* *ibid.* Oct. 1879); Prov. SUŌ: Ōuchimura, cult. (*D. Nikai!* herb. *ibid.* Oct. 25, 1892).

ADDITIONS.

- Page 76, line 14 from bottom, *after* "(1874)" *add*: et in Bull. Soc. Nat. Mosc. (1879) p. 38.
,, 80, *under* "Saxifraga cernua Linn." *add*: Poir. Encycl. Bot. VI. p. 690; Chamisso in Linnæa VI. p. 554; Hance in Journ. Bot. (1878) p. 11; Forbes et Hensl. in Journ. Linn. Soc. XXIII. p. 266.
,, 88, *under* "Chloranthus japonicus Sieb." *add*: Herd. Pl. Radd. in Act. Hort. Petrop. XI. p. 362.

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1903.

By

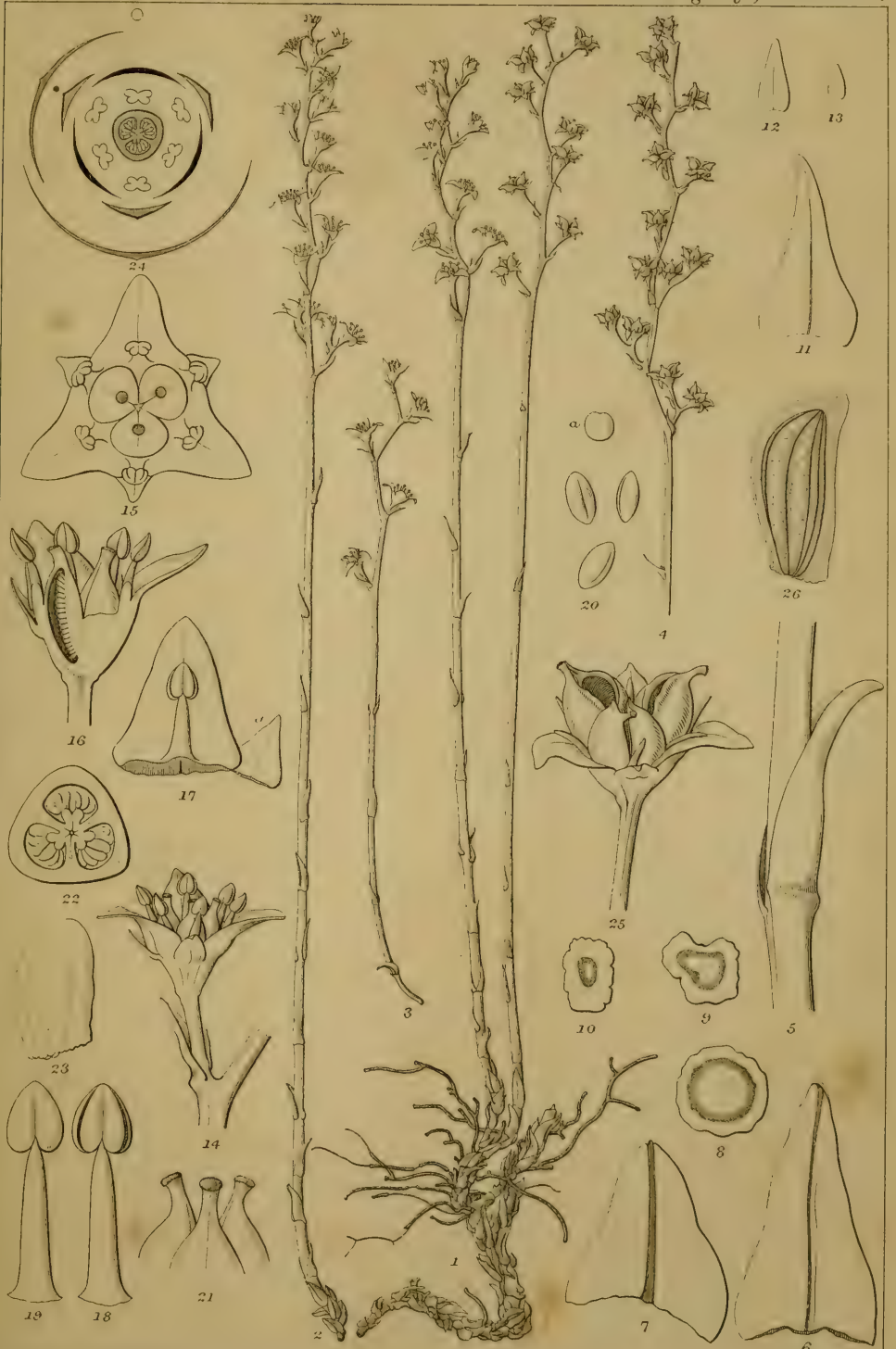
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TOKYO

1903.



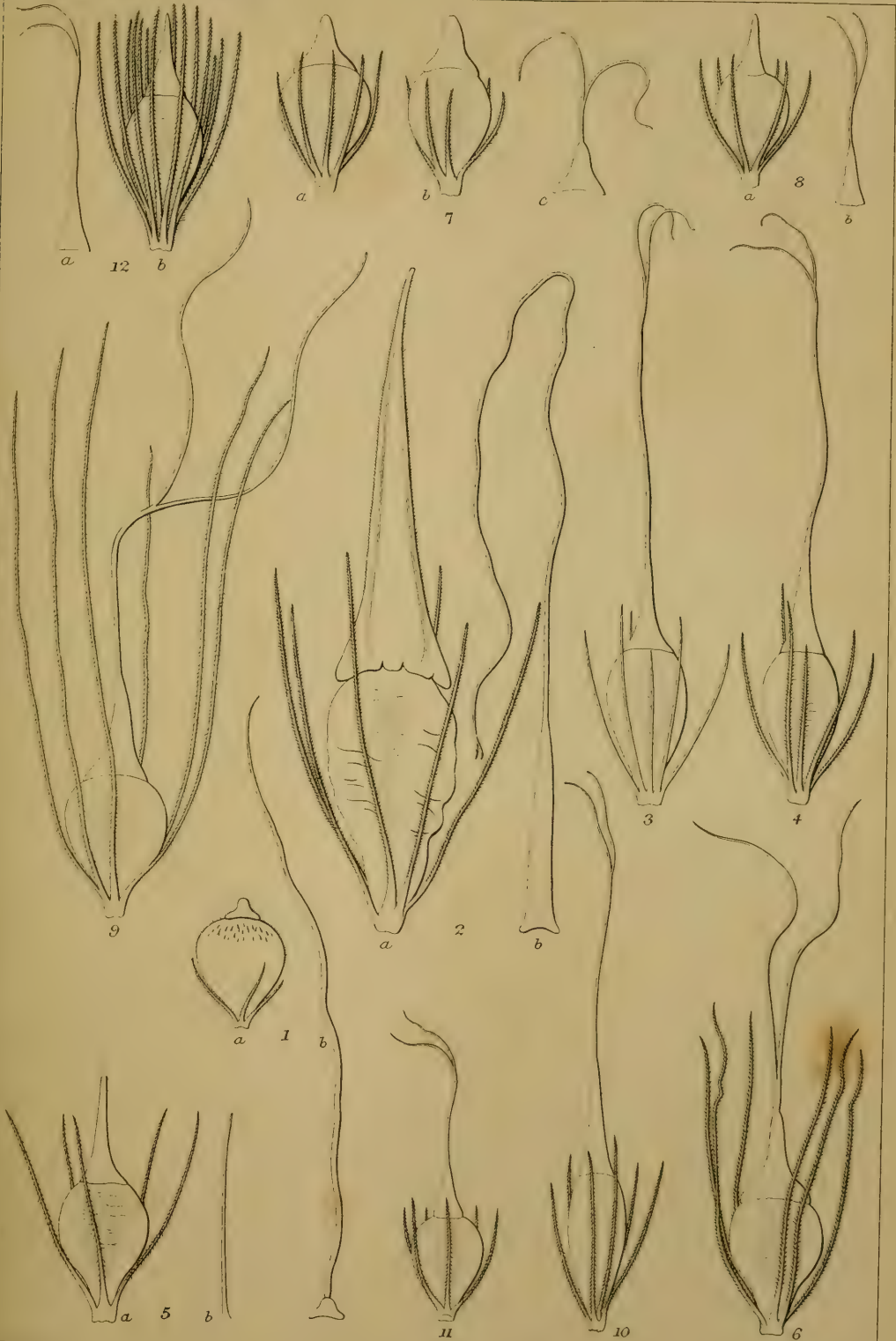
T. Makino ad nat. del.

F. Mishina sculpt.

Miyoshia Sakuraii, Makino.

サクラ井サウ (新種)





T.Makino ad nat.del.

All X10.

F.Mishina sc.

Observations on the Flora of Japan.*

Fasciculus III. 1903.

By

T. Makino,

Assistant in the Botanical Institute, Science
College, Imperial University of Tokyo.

Burmannia japonica Maxim. in litt.; Makino Illustr. Fl. Jap. I. n. 7, (1891) p. 4; Ito Mem. Work Bot. a. Zool. I. (1893) p. 14.

Burmannia sp. Makino l. c. I. n. 6, (1890) p. 1, tab. 35.

Burmannia capitata Makino in Bot. Mag., Tokyo, IV. (1890) p. 23; Matsum. Shokubutsu Mei-i, (1895) p. 55, non Linn.

Perennial, aphyllous, glabrous, white, $1\frac{2}{3}$ –8 cm. in height. Rhizome subterranean, tuberous, short, elliptical or oblong, perpendicular or oblique or sometimes horizontal, 4–10 mm. long, 3–4 mm. across, white, furnished with fibrous roots, dispersed with minute subulato-deltoid membranaceous scales above. Stem erect, rather stout, terete, smooth, attaining about $1\frac{1}{2}$ mm. in diameter, loosely scaly; scales subulato-lanceolate or subulato-ovate, acuminate or acute, entire, diaphano-membranaceous, 1-nerved, often adpressed to the stem, attaining about 6 mm. long, the lower ones subulato-deltoid, the basal ones more or less imbricated. Cyme terminal, 2–10-flowered, verticillato-subcapitate, 5–16 mm. across, the rachis extremely shortly dichotomous; bracts several, unequal in size, shorter than the flowers, broadly lanceolate but smaller and angustato-lanceolate in the superior ones, acuminate, diaphano-membranaceous, obscurely 1-nerved. Flowers white but brownish yellow in the perianth-lobes, very shortly pedicellate, 6–8 mm. long; perianth tubular, trigonous with very narrowly alate edges; perianth-lobes about $\frac{1}{2}$ as long as the tube, erect-patent, the outer ones deltoid-ovate or broadly ovate, with inflexed margin, acutish-obtuse, thickish, the inner ones much smaller and shorter than the outer, spatulato-oblong, rounded or retuse at the apex, convex internally. Stamens included, minute, inserted under the throat of the perianth-tube, opposite to the inner lobes of the perianth; the filament thick and very short; the

* BOTANICAL MAGAZINE, Tokyo, Vol. XVII. (1903.)

anther introrse, the cells oblong, disconnected by the short and thick connective. Style about 3mm. long, included, erect, slightly swollen at the top; stigmas erectpatently 3-fid, very minutely papillose, furrowed internally. Ovary inferior, 3-locular, with 3 axile placentas; ovules copious, minute, obovoid. Capsule obovoid-globose, 3-angled, membranaceous, crowned by the marcescent perianth, about 3mm. across. Seeds numerous, minute, $\frac{1}{2}$ mm. long, obovoid or obovoid-oblong, pale yellowish, with loosely reticulated testa which is closed to the embryo.

Nom. Jap. *Hina-no-shakudyō* (T. Makino).

Hab. Prov. MUSASHI: Shirako (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 19, 1880); Prov. TOSA: Sakawa (*T. Makino!* Aug. 1883), Mt. Imano in Hata-gōri (*T. Makino!* Aug. 7, 1889); Prov. ISE: Kusu-mura (*Y. Uyematsu, K. Teraoka, K. Imai!* Sept. 1902).

This species grows in the shade of forests in the middle and southern parts of Japan. It is very closely allied to *Burmattia Championii* Thwaites of Ceylon, with which it is probably identical; and also it has a resemblance to *B. tuberosa* Becc. of Borneo.

Burmattia nepalensis (Miers) Hook. fil. Fl. Brit. Ind. V. p. 666, (1888); Hemsl. in Ann. of Bot. V. (1891) p. 407; Ito Mem. Work Bot. a. Zool. I. (1893) p. 14, tab. 2, fig. 3-5.

Gonyanthes nepalensis Miers in Trans. Linn. Soc. XVIII. (1841) p. 537, tab. 38, fig. 1.

Cyanotis nepalensis Miers.

Gonyanthes Wallichii Ito Proc. Nat. Hist. Soc. Tokio, I. 2, (1890) p. 78, non Miers.

Nom. Jap. *Kirishima-sō, Kirishima-shakudyō* (T. Ito).

Hab. Prov. ŌSUMI: Mt. Takakuma (*K. Tamura!* Sept. 29, 1900).

In Japanese specimens the wings of the flower are lunate in shape, and not round or not retuse at the top. My specimens were kindly sent by Mr. Keisuke Tamura.

Scirpus (Silvaticæ) **Mitsukurianus** Makino, sp. nov.

Scirpus fuirenoides herb. Sc. Coll. Imp. Univ. Tokyo, ex parte, non Maxim.

Rhizome very short, oblique, thick, strong, rooting below. Stem erect,

strict, elate, attaining 2m. or more in height and about 8mm. in diameter, subtrigonus-terete, shining, foliate, branched above, the nodes not elevated. Leaves elongate, linear or broadly linear, 6-13mm. broad, long-acuminate, shorter than the stem but the superior ones exceeding it, scabrous on the margin and on the midrib dorsally, subcoriaceous, the cauline ones long-sheathing with the truncate mouth, the basal ones tufted; midrib delicately carinate dorsally; veins numerous, close, with loose delicate transverse venules between them. Cyme compound-corymboso-umbellate, but sometimes simply corymboso-umbellate in those of the branches, the terminal cyme 7-16cm. long, the lateral ones smaller; radii few to several, erect or erect-patent, unequal in length, the longest one about 10cm. long, slender, compressed-semiterete, smooth or slightly scabrous on the edges; pedicels of the 2nd umbel about 2-5, with a head at the top or sometimes bearing a tertiary umbel which has 1-2 short 1-headed pedicels, erect-patent, unequal in length, compressed, the longest one $4\frac{1}{2}$ cm. long; involueral bracts several, the outer 3 or 4 much longer than the cyme, but often shorter in those of the branches, linear, long-acuminate, scabrous on the margins and on the midrib dorsally, dilated and embracing at the base; bracts of the 2nd umbel about 2-5, angustato-linear, long-acuminate, the outer one longer and often exceeding the umbel. Spiculae sessile, 4-many, glomerate into a semi-globose or globular head 8-15mm. or sometimes 17mm. across, elliptical or oblong or sometimes oblong-cylindrical, obtuse, densely flowered, 5-7mm. or sometimes 12mm. long, brunneo-ferruginous, the central (interior) head sessile; rachilla straight, glabrous, thickish; bracteoles several, subulato-linear, long-acuminate, scabrous-margined, viridescent, the exterior ones often longer than the head. Glumes very numerous, densely imbricated, narrowly lanceolate or lanceolate, subnavicular, shortly acuminate, minutely scabro-serrulate above, 3mm. long, scarioso-membranaceous, 1-nerved, ferruginous, but viridescent in centre including the midrib. Setae 6, delicately filiform, much complicate, about 5mm. long but attaining 8mm. long in fruit, minutely spinulose towards the apex, light ferruginous. Stamen 1; filament filiform, glabrous, nearly equal to or slightly longer than the glume; anther linear. Ovary minute, obovato-oblong; style erect, about equal to the glume in height, 3-fid into very minutely papillose filiform 3 stigmas. Caryopsis small, narrowly obovate or obovate-oblong, compressed, rounded-obtuse at the apex, rostrate with the basal remain (nearly $\frac{1}{2}$ as long as the ovary) of the style, hardly 1mm. long, smooth, pale, extremely shortly stipitate.

Nom. Jap. *Matsukasa-susuki*.

Hab. Prov. MUSASHI: Shimura (*T. Makino!* Aug. 5, 1888, Sept. 1893), Yōda in Koiwa-mura (*T. Makino!* herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 1893), Koiwa-mura (*T. Makino!* Sept. 1894); Prov. SHIMOOSA: Mama (*R. Yatabe and J. Matsumura!* herb. ibid. Aug. 18, 1878; *S. Okubo!* herb. ibid. Sept. 29, 30, 1885); Prov. SAGAMI: Near Hiratsuka (*T. Makino!* Aug. 1894).

This is best distinguished from *Scirpus fuirenooides* Maxim. by the compound cyme, narrower glume, more delicate setæ, smaller caryopsis, robuster stem, and the broader leaves. It is not uncommon in the environs of Tokyo.

I have proposed to dedicate this elegant species to Prof. Dr. Kakichi Mitsukuri, Director of the Science College, Imperial University of Tokyo.

Scirpus (*Silvaticæ*) **fuirenooides** Maxim. in Mém. Biol. XII. p. 555, (1886).

Rhizome very short, oblique, thick, rooting below. Stem erect, strict, slender, attaining about 1 m. in height, subtrigonus-terete, shining, foliate. Leaves elongate, angustato-linear, long-acuminate, shorter than the stem but the superior ones exceeding it, glabrous, scabrous-margined, subcoriaceous, 3–7 mm. broad; midrib very delicately carinate beneath, scabrous on the carina above; veins very closely placed; sheath tubular, truncate at the mouth; the radical leaves cæspitose, dilated and embracing at the base. Cyme terminal ($2\frac{3}{4}$ –6 cm. long), or lateral (the lateral ones often 1-headed and sometimes long-stalked), simply corymboso-umbellate; pedicels 1–5, strict, erect or erect-patent, compressed, unequal in length, the longest one about $4\frac{1}{2}$ cm; involucrel bracts 1–5, unequal in length, angustato-linear, long-acuminate, dilated and clasping at the base, scabrous on the margins and on the midrib beneath, the external longest one exceeding the umbel. Spiculae numerous, sessile, glomerate into a semi-globose or globular head 1– $1\frac{2}{3}$ cm. across, oblong or oblong-cylindrical, obtuse, about 6–9 mm. long, darkish viridescent and then darkish fulvous, with ferruginous styles, the central (interior) head sessile; rachilla glabrous, thickish; bracteoles subulato-lanceolate, attenuatedly acuminate, hyalino-margined, usually shorter than the head. Glumes densely imbricated, lato-lanceolate, or ovate, subnavicular, acute at the apex with a spinulose tip, $2\frac{1}{2}$ –3 mm. long, subhyalino-membranaceous, scabro-serrulate on margin, colourless and then more or less light ferruginous, but darkish viridescent and then brunneo-ferruginous along the midrib. Setæ 6, filiform, glabrous and white, but scabro-spinulose and slightly enlarged and more or less orange-coloured

above, complicate below, 6mm. long in fruit. Stamens 2-1, filament filiform, glabrous, a little lower than the style; anther oblong-linear. Ovule obovate-oblong, compressed, smooth; style elongate, exceeding the glume, 3-fid into very minutely papillose filiform stigmas, ferruginous above. Caryopsis obovate, very shortly stipitate, compressed, smooth, obtuse at the apex, rostrate with the basal remain of the style, yellowish pale, $1\frac{1}{4}$ mm. long.

Nom. Jap. *Ko-matsukasasusuki*, *tama-susuki* (nov.).

Hab. Prov. MUTSU: Shichinohe (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 19, 1878); Prov. UGO: Foot of Mt. Chōkai (*I. Satō!* Oct. 1894); Prov. UZEN: Mt. Kimbō (*T. Nagasawa!* Oct. 5, 1892); Prov. ECHIGO: Itoegawa (*N. Nakagawa!* Aug. 1901); Prov. SHINANO: Karuizawa (*T. Makino!* Sept. 1888), Ikedamachi (*K. Tanaka!* Sept. 1901); Prov. HITACHI: Ōtsuka-mura (*H. Katayama!* Sept. 1901); Prov. MIKAWA: Ayato (*G. Nagura!* Sept. 18, 1897); Prov. ISE: Nagashima (*Z. Umemura!* Sept. 4, 1900); Prov. YAMASHIRO: Kamo-mura in Sōraku-gōri (*K. Tsuzi!* Oct. 1902); Prov. HARIMA: Tsurui-mura (*I. Hashimoto!* Aug. 15, 1902); Prov. BITCHŪ: Narai (*Z. Yoshino!* Aug. 1901).

This species is widely distributed over the Honsiu of Japan; I have not yet seen any specimen from Hokkaidō, Shikoku, and Kiusiu.

Aquilegia akitensis Huth in Bull. Herb. Boiss. V. (1897) p. 1090.

Petioles, petiolules, the under surface of blade, and peduncle villosulate with patent white fine hairs.

Nom. Jap. *Miyama-odamaki* (nov.).

Hab. Prov. MUTSU: Summit of Mt. Hakkōda (*A. Yasuda!* Aug. 13, 1902).

Rare. In my Herbarium I have a specimen, which I owe to the kindness of Prof. Atsushi Yasuda, *Rigakushi*, of the Second High School in Sendai. Mr. Y. Yabe, *Rigakushi*, also collected this species on Mt. Shirouma in the province of Shinano, in August 1902.

Sedum (*Seda genuina*, Aizoonta) **Yabeanum** Makino, sp. nov.

Perennial, caespitose, glabrous, about 13cm. high; roots few, elongate, subfusiform, castaneous, with fine short rootlets. Stems several, erect or ascending, often rooting below, terete, rose-coloured at the base, the flowering stems often provided with a few sterile branches at the middle portion.

Leaves sparse, approximate, patent, often reflexed, linear-spathulate, attenuated below, acutish or obtuse, entire, minutely auriculate at the base beneath, attaining about 18 mm. long, $4\frac{1}{2}$ mm. broad. Cyme terminal, about 3–5 cm. across, usually divaricately 3-branched, approximately many-flowered; branches often dichotomously divided; branchlets slightly flexuous, about 3–6-flowered; bracts similar to leaves but smaller. Flowers sessile, but the inferior ones extremely shortly pedicellate, 8–11 mm. in diameter, yellow. Calyx deeply 5-parted, erect-patent, small, much shorter than the petals; lobes oblong-lanceolate, obtuse. Petals 5, patent, linear-lanceolate, acuminate, shortly connate at the base, marcescent, $4\frac{1}{2}$ –6 mm. in length. Stamens 10, shorter than the petals and inserted at the bases of them, the oppositisepalous ones slightly longer than the oppositipetalous ones; filament filiform; anther minute, oval. Hypogynous scales minute, short, broad, truncate. Ovaries 5, erect, lanceolate, attenuated to the style above, about $3\frac{1}{2}$ mm. long including the style; style erect, shorter than the ovary; stigma punctiform. Follicles 5, erect-patent, oblong-lanceolate, compressed, with the persistent style, very shortly connate at the base, about $4\frac{1}{2}$ mm. long exclusive of the style, carpel thinly coriaceous, the ventral appendages manifest.

Hab. Prov. TSUSHIMA: Toishibuchi (*K. Hirata!* herb. Y. Suzuki, Aug. 15, 1902).

I have named it in honour of Mr. Y. Yabe, *Rikakushi*, who made a botanical tour in the island in 1901.

Corchoropsis tomentosa (Thunb.) Makino, nom. nov.

Corchorus tomentosus Thunb. Fl. Jap. (1784) p. 228, excl. nom.
Corchorus hirsutus Linn.

Corchoropsis crenata Sieb. et Zucc. in Abhandl. Akad. Muench. III. p. 738, tab. 4, h 1–14, et IV. 2, p. 164; Walp. Repert. V. p. 118; Miq. Prol. Fl. Jap. p. 206; Franch. et Sav. Enum. Pl. Jap. I. p. 66; Kanitz Anthoph. Jap. p. 23; Franch. Pl. David. p. 59; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 94; Diels in Engler's Bot. Jahrb. XXIX. p. 467; Bretschn. Hist. Eur. Bot. Disc. in Chin. I. p. 35.

Nom. Jap. *Karasu-no-goma*.

Hab. Prov. MUSASHI: Tokyo (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 25, 1879, Oct. 10, 1880), Okubo in Tokyo (*T. Makino!* Sept. 22, 1896), Arai near Tokyo (*T. Makino!* Sept. 22, 1896), Near

Nobitome (*S. Okubo!* herb. ibid. Sept. 29, 1882); Prov. Iyo: Furukawa (*K. Watanabe!* herb. ibid. Sept. 24, 1891); Prov. Sūō: Yamaguchi (*D. Nikai!* herb. ibid. Oct. 16, 1892).

Gleditschia horrida (Thunb.) Makino, non Willd.

Fagara horrida Thunb. in Trans. Linn. Soc. II. (1794) p. 329; Willd. Sp. Pl. I. (1797) p. 667; Pers. Syn. Pl. I. (1805) p. 144; Rœm. et Schult. Syst. Veg. III. (1818) p. 297, Mant. (1827) p. 225; Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 2, (1846) p. 121.

Zanthoxylum horridum DC. Prodr. I. (1824) p. 728.

Gleditschia japonica Miq. Ann. Mus. Bot. Lugd.-Bot. III. (1867) p. 54, et Prol. Fl. Jap. p. 242; Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 114, et II. (1879) p. 327; Maxim. in Mém. Biol. XII. p. 452 (1886); H. de Boiss. in Bull. Herb. Boiss. VI. (1898) p. 679.

Casalpiniodes japonicum O. Kuntze Rev. Gen. Pl. I. (1891) p. 167.

Fagara foliolis inæquilateris integris Thunb. Fl. Jap. (1784) Pl. Obsc. p. 350, n. 3.

Nom. Jap. *Saikachi*.

Hab. Japan, planted and subsontaneous.

Alsine Jooi Makino, sp. nov.

Small perennial, compactly tufted; roots fibrous. Stems gracile, many-branched, densely covered with died old leaves, but provided with living leaves towards the top of the ascending branches. Leaves dense, subrigidly herbaceous, opposite with the connate bases, spreading, often recurved, subulato-linear, acute, thick but thinner at the base, glabrous but setoso-ciliated, hyaline-margined often excepting the apex, plane or often somewhat concave above, convex beneath, 3-nerved but invisible superficially, 6-12 mm. long, 1-2½ mm. wide. Flower erect, campanulate, rounded-obtuse at the base, about 8 mm. long, shortly pedicellate, 2-bracteate; pedicel about 4½-5 mm. long, glanduloso-pubescent; bracts opposite, situated above the middle of the pedicel, foliaceous, ascending, oblong-lanceolate, concave, other characters as in the leaves. Calyx deeply 5-parted; lobes oblong or ovato-lanceolate, obtuse or acutish at the apex, entire, thickish and green, but hyaline on the margin, ciliated below, glanduloso-pubescent below externally, glabrous internally, with 3 main nerves accompanied by

few and very loose veinlets, 7–8 mm. long, $2\frac{1}{2}$ – $3\frac{1}{2}$ mm. wide. Corolla white, membranaceous, equal to or hardly longer than the calyx, 5-petaled; petals erect, oblong, rounded at the apex, acute and very shortly unguiculate, entire, with delicate and rather loose veins, about 7 mm. long, 3 mm. wide. Stamens 10, subhypogynous, shorter than the corolla, oppositipetalous ones very slightly shorter than those of oppositisepalous ones which have a pale-yellowish bigibbose gland at the base, the annulus very short, and subhypogynous; filament subulato-filiform, glabrous, white; anther elliptical, with darkish-purpurascens pollen. Ovary sessile, ovoid, obtusely trigonous, obtuse at the top, glabrous, $2\frac{1}{2}$ mm. long, 1-celled but imperfectly 3-celled at the top; styles 4 (probably normally 3), erect, very short, about $1\frac{1}{3}$ mm. long; ovules many, with a rather long funiculus, subreniform-rounded, campylotropous.

Nom. Jap. *Miyama-tsumekusa* (nov.).

Hab. Prov. SHINANO: Mt. Yatsuga-dake (*K. Jō!* July 1902).

Though I have unfortunately not seen the fruit of this species, it may probably be regarded as a variety of *Alsine macrocarpa* Fenzl. My specimen is due to the kindness of Mr. Kazuma Jō, *Hōgakushi*, and I have named this species in compliment to him.

Zelkova serrata (Thunb.) Makino, nom. nov.

Corchorus serratus Thunb. in Trans. Linn. Soc. II. (1794) p. 335; Willd. Sp. Pl. II. (1799) p. 1217; Pers. Syn. Pl. II. (1807) p. 67; Spreng. Syst. Veg. II. (1825) p. 584.

Corchorus hirtus Thunb. Fl. Jap. p. 228, non Linn.

Ulmus Keaki Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Gen. XII. (1830) p. 28.

Zelkova Keaki Maxim. in Mém. Biol. IX. p. 21; Franch. et Sav. Enum. Pl. Jap. I. p. 430; Sargent Forest Fl. Jap. p. 58, tab. 19.

Planera acuminata Lindl.; Regel Gartenfl. (1863) p. 56.

Zelkova acuminata Planch. "Compt. Rend. Acad. Paris, LXXIV. (1872) p. 1496," et in DC. Prodr. XVII. p. 166; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 449; Engler in Engl. et Prantl Nat. Pfl.-Fam. III. 1, p. 65; Palib. Consp. Fl. Kor. II. p. 44.

Abelicea acuminata O. Kuntze Rev. Gen. Pl. II. p. 621.

Planera japonica Miq. Ann. Mus. Bot. Lugd.-Bat. III. p. 66, et Prol. Fl. Jap. p. 254; Hemsl. in Journ. Bot. (1876) p. 209.

Nom. Jap. *Keyaki*.

Hab. Japan, widely distributed.

Rhodotypos tetrapetala (Sieb.) Makino, nom. nov.

Kerria tetrapetala Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Gen. XII. (1830) p. 69.

Rhodotypos kerrioides Sieb. et Zucc. Fl. Jap. I. (1835) p. 187, tab. 99, fig. I. 1-16, et in Abhandl. Akad. Muench. IV. 2, p. 125; Walp. Repert. V. p. 658; Miq. Prol. Fl. Jap. p. 221; Franch. et Sav. Enum. Pl. Jap. I. p. 122; Regel Gartenfl. (1866) p. 130, tab. 505, fig. 2-3; Bot. Mag. tab. 5805; Maxim. in Act. Hort. Petrop. VI. p. 244; Hance in Journ. Bot. (1878) p. 10; Focke in Engl. et Prantl Nat. Pfl.-Fam. III. 3, p. 28; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 229; Ito et Matsum. Tent. Fl. Lutch. I. p. 180.

Nom. Jap. *Shiro-yamabuki*.

Hab. Japan, commonly cultivated, but grows wild in the province of Bitchū according to Z. Yoshino.

Osmorhiza aristata (Thunb.) Makino et Yabe, nom. nov.

Cheerophyllum aristatum Thunb. Fl. Jap. (1784) p. 119; Willd. Sp. Pl. I. (1797) p. 1454; Pers. Syn. Pl. I. (1805) p. 320; DC. Prodr. IV. p. 228.

Myrrhis aristata Spreng. Umb. Spec. (1818) p. 133, et Syst. Veg. I. p. 902; Schult. Syst. Veg. VI. (1820) p. 512.

Uraspermum aristatum O. Kuntze Rev. Gen. Pl. I. p. 270.

Osmorhiza japonica Sieb. et Zucc. in Abhandl. Akad. Münch. IV. 2. (1843) p. 203; Franch. et Sav. Enum. Pl. Jap. I. p. 183; Maxim. in Mél. Biol. XII. p. 469; Drude in Engl. et Prantl Nat. Pfl.-Fam. III. 8, p. 153; Yabe Rev. Umbel. Jap. p. 23.

Osmorhiza longistylis A. Gray in Perry's Exped. Jap. II. (1857) p. 312, et Bot. Jap. in Mem. Am. Acad. Art. et Sc. n. s. VI. (1859) p. 391; Miq. Prol. Fl. Jap. p. 252.

Nom. Jap. *Yabu-ninzin, naga-zirami*.

Hab. Japan, common.

Chamæle decumbens (Thunb.) Makino, nom. nov.

Sium decumbens Thunb. Fl. Jap. (1784) p. 118; Willd. Sp. Pl. (1797) p. 1435; Pers. Syn. Pl. I. (1805) p. 316; Schult. Syst. Veg. VI. p. 544; Spreng. Syst. Veg. I. (1825) p. 906; DC. Prodr. IV. p. 126.

Chamaele tenera Miq. Ann. Mus. Bot. Lugd.-Bat. III. (1867) p. 60, et Prol. Fl. Jap. p. 247; Franch. et Sav. Enum. Pl. Jap. I. p. 184, et II. p. 374.

Ægopodium tenerum Yabe Rev. Umbel. Jap. p. 46.

Nom. Jap. *Sentō-sō*.

Hab. Japan, common.

Alsine arctica (Stev.) Fenzl "Verbreit. d. Alsin. p. 18," et in Ledeb. Fl. Ross. I. p. 355; Regel Pl. Radd. I. pp. 338, 346, excl. var. β .

Arenaria arctica Stev. in litt. ex DC. Prodr. I. (1824) p. 404; Cham. et Schlecht. in Linnæa I. p. 54; Spreng. Syst. Veg. II. p. 399; Hook. Fl. Bor. Amer. I. p. 100, tab. 34, excl. var. γ .; Torr. et Gray Fl. N. Amer. I. p. 181, excl. var. γ .; Robins. in A. Gray Syn. Fl. N. Amer. I. 1, p. 247.

Arenaria sajanensis Willd. herb. ex Spreng. l. c.

Arenaria verna var. *borealis* herb. Sc. Coll. Imp. Univ. Tokyo, et Cat. Herb. Coll. Sc. Imp. Univ. Tokyo, (1886) p. 23, non Fenzl.

Leaves linear-subulate, obtuse, 1 or obsoletely 3-nerved, subcarnose. Peduncles 1-rarely 2-flowered. Flower 8-12 mm. across. Sepals very obtuse. Petals usually scarcely twice the length of sepals. Stamens shorter than the petals. Ovary ovoid-oblong.

Nom. Jap. *Takane-tsumekusa* (nov.)

Hab. Prov. SHINANO: Mt. Komagadake (*R. Yatabe*! herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 2, 1880; *K. Yazawa*! Aug. 1893; *K. Watanabe*! Aug. 1-3, 1894; *S. Hara*! Aug. 31, 1902; *K. Tanaka*! Sept. 25, 1902), Mt. Shirouma (*M. Orii*! Aug. 29, 1902); Prov. ETCHŪ: Mt. Tateyama (*R. Yatabe* and *J. Matsumura*! herb. ibid. July 24, 1884); Prov. KITAMI: Isl. Riishiri (*T. Kawakami*! herb. ibid. Aug. 1899).

Not uncommon on alpine mountains in middle and northern Japan. New to the Flora of Japan.

Alsine verna (Linn.) Bartl. var. *borealis* Fenzl in Ledeb. Fl. Ross. I. p. 349; Maxim. in Mém. Biol. IX. p. 23; Franch. et Sav. Enum. Pl. Jap. II. p. 298.

Leaves linear-subulate or setaceo-linear, acute, strongly 3-nerved. Stems erect from the ascending bases, slender, remotely leaved, 1-5-flowered; pedicels capillaceo-filiform. Flower about 8 mm. in diameter. Sepals acuminato-acute, strongly 3-nerved. Petals as long as the sepals. Stamens as long as the petals. Ovary ovoid.

Icon. Inuma's Sōmoku-Dzusetu VIII. fol. 33 recto.

Nom. Jap. *Hosoba-tsumekusa*.

Hab. Prov. RIKUCHŪ: Mt. Hayachine (*O. Satō*, July 28, 1902).

Much rare than the preceding, growing on alpine mountains in Northern Japan. My specimens were kindly sent by Mr. O. Satō.

***Alsine macrocarpa* Fenzl var. *Jooi* Makino.**

Alsine Jooi Makino, vide supra.

Capsule large, twice and one-half as long as the sepal, conical, 11 mm. long, 6 mm. broad, glabrous; carpels 3, coriaceous. Seed discoid, compressed, 1 mm. across, pale-yellowish, cristato-fimbriate on the margin.

Hab. Prov. SHINANO: Mt. Yatsugadake (*K. Tanaka!* Sept. 1902, in fruits).

***Anemone* (*Pulsatilla*, *Campanaria*) *patens* Linn. var. *hirsutissima* (Pursh) Makino.**

Clematis hirsutissima Pursh Fl. Am. Sept. II. (1814) p. 385.

Anemone Nuttalliana DC. Syst. I. (1818) p. 193, et Prodr. I. (1824) p. 14; Wood Cl.-Book p. 202; Prantl in Engl. et Prantl Nat. Pfl.-Fam. III. 2, p. 62.

Pulsatilla Nuttalliana Spreng. Syst. Veg. II. (1825) p. 663; Gray Man. Bot. ed. 2, (1856) p. 4.

Anemone patens var. *Nuttalliana* Gray Man. Bot. ed. 5, p. 36, et Syn. Fl. N. Amer. I. 1, p. 9; Maxim. Enum. Pl. Mongol. I. (1889) p. 10.

Anemone ludoviciana Nutt. Gen. N. Am. Pl. II. (1818) p. 20.

Anemone patens Hook. Fl. Bor.-Am. I. p. 4; Torr. et Gray Fl. N. Am. I. p. 11, non Linn.

Pulsatilla patens Gray Gen. Ill. I. p. 18, tab. 3, non Mill.

Pulsatilla patens var. β . *Wolfgangiana* Trautv. et Mey.; Regel Pl. Radd. I. (1861) p. 21, in adnot.; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 30; Korsh. in Act. Hort. Petrop. XII. p. 295.

Anemone flavescens Zucc.; Pritz. in *Linnaea* XV. (1814) p. 585.

Pulsatilla angustifolia Turcz. Pl. exsicc. ex Regel l. c.

subvar. Taraoi Makino.

Adonis villosa Miyabe in Tarao, Chishima-Tanken-Jikki [千島探檢實紀] (1893) p. 105, cum icon, non Ledeb.

Plant densely clothed with long silky pale villose hairs. Leaves many-cleft. Flower appearing before the leaves. Sepals about 11, linear-spathulate to angustato-oblong, obtuse, densely covered with long silky pale villose hairs externally, glabrous and closely many-veined internally, 22–27 mm. long, $4\frac{1}{2}$ –8 mm. wide, ochroleucous.

Ncm. Jap. *Kataoka-sō* (K. Miyabe).

Hab. Prov. CHISHIMA (Kurile Islands): Isl. Brat Chirpoef (*C. Tarao!* June 18, 1892).

It is distinguished from the type by its numerous sepals. My specimen I owe to the kindness of Mr. T. Kataoka, a chamberlain in the Imperial palace, who was making an Official inspection in the Kurile islands at the time of the collection, and was collected by Mr. C. Tarao, who went to the islands in his suite. The Japanese name *Kataoka-sō* was proposed by Dr. K. Miyabe as a memorial name.

var. intermedia (Regel) Makino.

Pulsatilla patens var. *intermedia* Regel Pl. Radd. I. (1861) p. 21, in adnot.

Pulsatilla patens var. *Wolfgangiana* Trautv. in Pl. Schrenk in Bull. Nat. Mosc. (1868) p. 61, excl. syn. ex Regel l. c.

Pulsatilla patens? var. *foliis decompositis* Maxim. Prim. Fl. Amur. p. 19.

Nom. Jap. *Tsukumo-gusa* (K. Jō).

Hab. Prov. SHINANO: Mt. Yatsugadake (*K. Jō!* July 17, 1902; *K. Tanaka* Aug. 1902).

This variety new to the Flora of Japan.

Draba (*Chrysodraba*) **japonica** Maxim. in Mém. Biol. IX. p. 608; Franch. et Sav. Enum. Pl. Jap. II. p. 282; H. de Boiss. in Bull. Herb. Boiss. VII. p. 795.

Loosely caespitose, stoloniferous. Rosulate leaves narrowly lanceolate, entire, thinly pubescent with stellate hairs; cauline ones ovato-oblong, dentate. Stem, rachis, and pedicels pubescent. Silicle oblong or obovato-oblong, compressed, glabrous, oligospermous.

Nom. Jap. *Nambu-inunadzuna* (R. Yatabe).

Hab. Prov. RIKUCHŪ : Mt. Hayachine (*O. Satō!* July 28, 1902).

Draba (Leucodraba) **Sakurairi** Makino, sp. nov.

Draba sp. Inui, Hattori, et Kusano in Bot. Mag., Tokyo, XII. (1898) p. 6.

Loosely caespitose, 6–13 cm. high in fruit. Caudex oblique. Leaves pubescent with stellate subrigid hairs; rosulate leaves oblong or oblong-spathulate, submucronato-acutish or obtuse, gradually narrowed below, sometimes minutely 1–6-dentate or entire, attaining $2\frac{1}{2}$ cm. long, 9 mm. wide; cauline ones 3–5, sessile, elliptical or ovate, dentate, 9–12 mm. long. Stem usually simple, rarely with single branch, erect, pubescent with stellate patent hairs. Raceme about 17–28-flowered; rachis slender, pubescent with simple or furcate patent hairs, but with stellate hairs below, slightly longer than the stem in fruit; pedicel erect-patent, gracile, 4–11 mm. long in fruit, pubescent with simple patent hairs. Flowers 6–7 mm. across. Sepals elliptical, rounded-obtuse, pilosulate on the back, $2\frac{1}{4}$ – $2\frac{1}{2}$ mm. long, 2 lateral ones much concave; main nerves 3, free or connate at the top, with loose few veinlets. Petals a little longer than the twice the length of the sepals, oval-obovate, submarginate, rather abruptly attenuated to a short unguis, 5 mm. or a little more long. Stamens glabrous, the longer ones slightly longer than the sepals; filament subulate, dilated below; anther ovato-oval. Ovary oblong-linear, attenuated below, very shortly stipitate; style subclavate, nearly one-half as long as the ovary. Silicle linear-oblong, 6–9 mm. long, compressed, glabrous, but slightly pubescent when young, the style gracile and distinct, the stigma shortly bifid. Seeds rather numerous, elliptical, with a tail which is often a little longer than the seed.

Nom. Jap. *Togakushi-nadzuna* (nov.)

Hab. Prov. SHINANO: Hyakken-nagaya in Mt. Togakushi (*H. Sakurai!* herb. Imp. Mus., July 1892; *K. Watanabe!* June 10, 1894; *S. Kusano!* Aug. 17, 1897).

On rocks of mountains.

Draba (Leucodraba) **sinanensis** Makino, sp. nov.

About 11 cm. high in fruit. Loosely caespitose; caudex elongate. Leaves pubescent with stellate hairs; rosulate ones oblong-spathulate to narrowly oblanceolate-spathulate, acute or acutish, narrowly attenuated

below to a petiole, usually argutely 2-6-dentate above, attaining 22 mm. in length; cauline ones 4-6, sessile, ovato-oblong to narrowly oblong, acute, subpectinato-dentate with argute subulate teeth, attaining about 2 cm. long. Stem erect, pubescent. Raceme 12-29-flowered; rachis and pedicels glabrous. Flower about 9 mm. across, white. Sepals glabrous, oblong, obtuse and minutely pauci-suberose at the apex, green, but pale and membranaceous on the margin, with 3 veins which are connected at the end, about $3\frac{1}{2}$ mm. long. Petals nearly twice the length of the sepal, elliptical, rounded-subretuse, shortly clawed. Stamens shorter than sepals; filament subulate, dilated towards the base, glabrous; anther elliptical. Ovary oblong, glabrous, about 12-ovuled; style shorter than the ovary; stigma sub-bilobed. Silicle linear-oblong, often slightly curved, acute at the upper end, compressed, glabrous, 5-8 mm. long, the lower ones shorter than the gracile erect-patent pedicels, the style short, gracile, with a shortly bifid stigma. Seeds several, elliptical, beaked at the top.

Nom. Jap. *Miyama-nadzuna* (K. Tanaka).

Hab. Prov. SHINANO: Mt. Togakushi (*Kōichi Tanaka!* 1901), Mt. Yatsugadake (*K. Tanaka!* Aug. 1902).

Probably a variety of the preceding.

***Draba* (Leucodraba) *nipponica* Makino, sp. nov.**

Cæspitose, attaining 7 cm. in height in fruit. Caudex branched, finely and densely rooting, the branches short and ascending. Stems lax, erect, gracile, simple, glabrous. Leaves thinly pubescent with stellate and simple hairs and then subglabrate, ciliate; rosulate ones dense, erect-patent, linear-spathulate, narrowly attenuated below to a petiole, acute or acutish, argutely 2-4- or 5-dentate above, attaining about $1\frac{2}{3}$ cm. in length; cauline ones oblong or oblong-lanceolate, laxly pectinately dentate with erect-patent linear-subulate argute teeth, attaining about 1 cm. long, the uppermost one sometimes linear and entire. Raceme 7-20-flowered, longer or shorter than the stem; rachis gracile, glabrous; pedicels gracile, erect-patent, glabrous. Flower about 7 mm. across, white. Sepals small, elliptical, subtruncate or emarginate, thin, glabrous, 2 mm. long, with delicate free 3 veins. Petals $2\frac{1}{3}$ as long as the sepals, 5 mm. long, elliptical, emarginate, shortly cuneate to a short claw. Stamens longer than the sepals; filament subulate, dilated towards the base; anther small, oblong-elliptical. Ovary narrowly oblong, glabrous; style short, stout; stigma

subcapitate, slightly 2-lobed. Silicle broadly linear or linear-oblong, 5-11 mm. long, compressed, glabrous, straight or curved or slightly twisted, often dark-purple, the lower ones a little shorter than the pedicel, the style short, with a shortly bifid stigma. Seeds rather numerous, elliptical, beaked at the top.

Nom. Jap. *Kumoma-nadzuna*.

Hab. Prov. SHINANO: Mt. Akadake (*K. Yazawa!* Aug. 1897); Prov. KAI: Mt. Yatsugadake (*Keisaku Tamura!* Aug. 30, 1902).

Draba (*Leucodraba*) **ondakensis** Makino, sp. nov.

Laxly caespitose. Caudex ramose, with loosely rosulate leaves at the top. Leaves incano-pubescent and ciliated with stellate fine hairs; rosulate ones oblanceolate or narrowly oblanceolate, acute or obtuse, narrowly attenuated below to a petiole, 2-4-dentate, attaining about $2\frac{3}{4}$ cm. long; cauline ones sessile or subpetiolate, oblanceolate to oblong, acute, dentate or sometimes entire, about $1\frac{1}{2}$ - $2\frac{1}{4}$ cm. long. Stem about 11-15 cm. long including the raceme in fruit, slender, pubescent with stellate hairs, 2-several-leaved. Raceme 20-flowered, shorter than the stem; rachis gracile, pubescent; pedicels patent, gracile, puberulent or glabrate, attaining about $1\frac{2}{3}$ cm. long in the lower ones in fruit. Silicle broadly linear, or linear, straight, compressed, acute at the both ends, glabrous, about 6-11 mm. long, the style short, gracile with a bifid stigma. Seeds many, oblong-elliptical or elliptical, manifestly beaked at the top.

Nom. Jap. *Takane-nadzuna* (nov.).

Hab. Prov. SHINANO: Mt. Ondake (*Herb.!* Imp. Mus.; *K. Tanaka!* Sept. 1, 1902).

Primula farinosa Linn. var. **mistassinica** (Michx.) Pax in Engler's Bot. Jahrb. X. (1889) p. 200; Makino in Bot. Mag., Tokyo, XI. (1897) p. 111.

Primula mistassinica Michx. Fl. Bor. Amer. I. (1803) p. 124; Lehm. Monogr. Gen. Prim. p. 63, tab. 7; Rœm. et Schult. Syst. Veg. IV. p. 144; Spreng. Syst. Veg. I. p. 576; Cham. et Schlecht. in Linnæa I. p. 213; Duby in DC. Prodr. VIII. p. 43; Hook. in Bot. Mag. tab. 2973; Hook. et Arn. Bot. Beechey's Voy. p. 129; Gray Man. Bot. ed. 5, p. 314 et Syn. Fl. N. Amer. II. 1, p. 58.

Primula borealis Duby in DC. l. c. p. 43; Ledeb. Fl. Ross. III. p. 15; Regel in Act. Hort. Petrop. III. p. 149; Herd. Pl. Radd. IV. p. 114; Gray Syn. Fl. N. Amer. II. 1, p. 58.

Primula parvifolia Duby in DC. l. c. p. 42.

Primula gigantea Jacq.; Willd. Sp. Pl. I. (1797) p. 805; Pers. Syn. Pl. I. p. 170; Lehm. l. c. p. 61, tab. 6.

Primula pusilla Goldie, (1822); Spreng. l. c. p. 575; Hook. in Bot. Mag. tab. 3020, non Wall.

Primula farinosa Nutt. non. Linn.

Primula macrocarpa Maxim. in Mém. Biol. VI. p. 269, (1867); Franch. et Sav. Enum. Pl. Jap. I. p. 300; Franch. in Bull. Soc. Philom. Paris, 14 avril 1888, p. 10; Pax in Engler's Bot. Jahrb. X. p. 211; Miyabe Fl. Kuril. Isl. in Mem. Bost. Soc. Nat. Hist. IV. p. 250, in adnot.

Small. Leaves long-petiolate, ovato-rotund, or rhombeo-ovate, or elliptical, irregularly sharp-dentate, abruptly cuneate at the base, glabrous, efarinose but often with a mere trace of farinose beneath, 7–13 mm. long, 7–11 mm. wide; petiole narrowly winged, attaining about $2\frac{1}{3}$ cm. in length. Scape erect, exceeding the leaves, $4\frac{1}{2}$ – $5\frac{1}{2}$ cm. high, 2–3-flowered; involucre subulate, acuminate, shorter than the pedicels. Calyx tubuloso-campanulate, 5-fid, persistent; lobes very slightly shorter than the tube, erect, lato-lanceolate, acutish. Capsule cylindrical, twice the length of the calyx, 6–7 mm. long; valves obtuse.

Nom. Jap. *Hime-kozakura* (T. Makino.)

Hab. Prov. RIKUCHŪ: Mt. Hayachine (*O. Satō!* July 28, 1902).

This is only rarely found on alpine mountains of the northern part of Japan. I approve of Dr. K. Miyabe's view to take *Primula macrocarpa* Maxim. as a synonymy to *P. mistassinica* Michx.

Athyrium nikkoense Makino, sp. nov.

Caudex short, erect or ascending, very thickly covered with the basa remains of old stipes, densely rooting below. Stipes caespitose, much shorter than the frond, narrow, pale when dried but brownish dark at the base, densely clothed with scales towards the base, about 1–14 cm. long; scales lanceolate to linear, acuminate, entire, membranaceous, ferrugineo-rufous, often castaneous towards the centre, attaining about 10 mm. long, venules very delicate forming many longitudinal areolæ. Frond simply pinnate, narrowly lanceolate, acuminate, narrowed below, 8–40 cm. long,

2½–9 cm. broad, often rather firmly herbaceous, glabrous; rachis slender, weak, pale when dried but sometimes purpurascens, often fibrilloso-squamose at the base of pinnae; pinnae numerous, 15–28 on each side, usually alternate, sessile, patent and often approximate, but the inferior ones apart and more or less reflexed and gradually diminished in size, narrowly deltoid-lanceolate and usually acuminate, but narrowly deltoid and acute or obtuse in the inferior ones, truncate or subtruncate at the base, pinnatifid with closed sinuses, attaining about 4½ cm. long in the middle ones; lobes elliptical or ovato-oval, rounded or obtuse at the apex, irregularly paucicrenate or pauci-serrate, the upper basal one largest and oblong; venation conspicuous, often slightly elevated beneath when dried; veins erect-patent, flexuous, pinnate; venules loose, erect-patent, simple or sometimes furcate. Sori proportionally large, 1–5 (their lowest ones forming a row on each side of the midrib apart from it) to each lobe of the pinnae, but more numerous in the upper basal lobe, dorsal on the upper portion of the venules, elevated, hippocrepiform or reniform or elliptical; indusium thinly membranaceous, entire or suberose on the margin, persistent. Sporangia obovato-oval, the pedicel about as long as the case; spore elliptical, rugose, yellowish.

Nom. Jap. *Iwa-inuwarabi* (nov.).

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (*T. Makino!* Aug. 29, 1901), Between Ashio and Mt. Kōshin (*T. Makino!* Sept. 11, 1901).

This species has undoubtedly an affinity to *Athyrium yokoscence* (Franch. et Sav.) Christ, though simpler in form and smaller in size. As far as I know, the habitat is restricted to rocky place of mountains, found rarely.

Athyrium yokoscence (Franch. et Sav.) Christ in Bull. Herb. Boiss. IV. (1896) p. 668.

Asplenium yokoscence Franch. et Sav. Enum. Pl. Jap. II. (1879) pp 225, 622.

Caudex short, erect or ascending, thickly covered with castaneous bases of old stipes. Stipes caespitose, erect, slender, clothed with scales towards the base, pale-stramineous, attaining about 28 cm. long, but sometimes short and 3½ cm. long; scales lanceolate to linear, acuminate, entire, firmly or thinly membranaceous, ferruginous and concolorous, but often castaneous excepting the margin. Frond oblong or oblong-lanceolate,

acuminate, bipinnatifid or subbipinnate, 16–34 cm. long, 5–17 cm. wide, firmly herbaceous, glabrous; rachis slender, sometimes fibrilloso-squamose below; pinnæ 12–18 on each side, patent or sometimes erect-patent, often more or less reflexed in the inferior ones, sessile, alternate or sometimes subopposite, lanceolate or angustato-lanceolate, often falcate, acuminate, truncate at the base, deeply pinnatifid, or subpinnate, usually a little apart or approximate, largest in the middle ones; pinnules numerous, patent, approximate or subapproximate, ovato-lanceolate, or oblong-lanceolate, acute or shortly acuminate, sharp-serrate or crenato-serrate, usually auriculate at the upper base, the upper basal pinnule larger; venation conspicuous; veins flexuous, pinnate; venules erect-patent, loose, simple or the lower ones furcate or pauci-pinnate. Sori small, 1–many to each pinnule, often confluent when fully matured, elevated, dorsal on the upper portion of venules, oblong but the lower ones reniform or obliquely hippocrepiform; indusium very thinly membranaceous, entire-margined. Sporangia obovato-oval, the pedicel equal to or shorter than the case; spore elliptical, alato-rugose.

Hab. Japan, widely distributed, found growing on mountains and wooded hills.

This is allied to *Athyrium Filix-femina* Roth, but is evidently distinct from it.

Fimbristylis (*Trichelostylis*) **tonensis** Makino in Bot. Mag., Tokyo, IX. (1895) p. 260.

Annual, glabrous, densely caespitose, 12–25 cm. high. Roots fibrous, fusco-castaneous. Stems slender, glabrous, much compressed, with smooth edges. Leaves basal, few to each stem, angustato-linear, acuminate, sheathing at the base, shorter than the stem, 3–18 cm. long, 1–2½ mm. broad, 1 or 3-nerved, with closed venules, the margin thickish and smooth excepting the upper which is very finely scabrous. Cyme compound-umbellate, 1½–6 cm. across, with many spiculæ; radii and pedicels unequal in length; the interior spicula of the umbel sessile. Involucral bracts few, unequal in length, angustato-linear, acuminate, finely scabro-spinulose on the margin, the outermost one largest and slightly longer or shorter than the cyme; bracteoles short, subulato-linear, aristato-acuminate, scarious on both sides of the midrib. Spiculæ oblong, or oblong-subcylindrical, comosely covered with numerous patent ferruginous style-branches, 4–6 mm. long.

Rachilla straight, glabrous. Glumes numerous, imbricated, angustato-oblong, navicular, aristato-acuminate, entire, scarious, pale-ferruginous, 2-nearly 3 mm. long; carina sub-3-nerved, viridescent. Stamen 1, lower than the style and nearly equal to the glume in height; filament filiform, glabrous; anther small, linear, $\frac{1}{2}$ mm. long. Style manifest, overtopping the glume, rather stout, dilated at the base, deeply 3-fid into 3 branches, persistent; branches long, aristiform, patent, arcuate, ferruginose, papillose-hairy, longer than the main portion. Caryopsis oblong-cylindrical, straight, pale, smooth but delicately trabeculate under microscope, 1 mm. long.

Hab. Prov. MUSASHI: Koiwa-mura, sandy place on the side of River Tone (*T. Makino!* Aug. 1893); Prov. KADZUSA: Ichinomiya, muddy place near sea (*T. Makino!* Sept. 5, 1898).

This species has the general habit of *Fimbristylis autumnalis* Rœm. et Schult., but is very distinct from it. The spikelets are remarkable by the comose-squarrose deep-ferruginous style-branches. It seems to be closely allied to *F. Stauntoni* Debeaux et Franch. of China.

Fimbristylis (*Dichelostylis*) **verrucifera** (Maxim.) Makino in Bot. Mag., Tokyo, IX. (1895) p. 259.

Isolepis verrucifera Maxim. Prim. Fl. Amur. (1859) p. 300; Regel. Tent. Fl. Ussur. n. 544.

Fimbristylis nipponensis Makino l. c. VI. (1892) p. 47, (nomen tantum).

Annual, glabrous. Roots fibrous, pale brownish. Stems numerous, caespitose, unequal in length, $1\frac{1}{2}$ –20 cm. long, slender, compressed, diffuse or erect-patent or sometimes erect. Leaves basal, 1–2 to each stem, shorter or much so than the stem, capillaceo-setaceous, with a membranaceous sheath at the base. Cyme simply umbellate or sometimes subcompound-umbellate, $\frac{1}{2}$ –4 cm. across, rarely in depauperated monostachyous; radii 1 to 14, unequal in length, capillary, erect-patent or divaricately spreading, monocephalous, the longest one about $2\frac{1}{2}$ cm.; involueral bracts few to several, capillary, shorter or longer than the cyme. Spiculae ovoid-globose to ovoid-oblong, $2\frac{1}{2}$ –6 mm. long, 2–3 mm. across, viridescent, densely imbricated with setose glumes, the interior spicula sessile. Glume oblong, subcarinato-convex, thinly membranaceous, pale-hyaline, $1\frac{1}{2}$ mm. in whole length, with a very delicate nerve near on each side of the midrib; midrib green, long-produced into a straight and erect setose tail which is

shorter than the glume itself. Stamen 1, a little exceeding the glume; filament filiform, glabrous; anther small, linear-oblong, $\frac{1}{3}$ mm. long. Style erect, very slightly lower than the glume but very slightly exceeding it in fruit, long, filiform, glabrous, somewhat bulbous at the base, persistent, 2-fid; branches delicate, granular-papillose, shorter than the main portion and also a little shorter than the matured caryopsis; ovary oblong-cylindrical, smooth, pale, $\frac{2}{3}$ mm. long, very shortly stipitate. Caryopsis about one-half as long as the glume (omitting the seta), oblong-cylindrical, somewhat compressed, nearly straight, smooth, but obscurely trabeculate under microscope, yellowish-ferruginous, about $\frac{3}{8}$ mm. long, shortly stipitate, provided with very shortly stipitate 1-5 pale verrucæ on each side.

Hab. PROV. HITACHI: Mito, side of Lake Semba-numa (*T. Makino!* Aug. 11, 1890); PROV. RIKUZEN: Iwakiri (*T. Makino!* Aug. 21, 1890); PROV. UZEN: Ōtori-mura in Higashi-tagawa-gōri (*T. Nagasawa!* Aug. 12, 1891); PROV. UGO: Koidzumi in Kwan-onzi-mura (*I. Satō!* Sept. 26, 1891, Sept. 1892); PROV. MUSASHI: Koiwa-mura (*T. Makino!* Aug. and Sept. 1893); PROV. SHIMOOSA: Ichikawa (*T. Makino!* Oct. 6, 1895); PROV. IYO: Matsuyama (*Z. Umemura!* Sept. 1, 1897).

This seems to be distinct from *Fimbristylis dipsacea* Benth. (= *Scirpus dipsaceus* Rottb. Descr. et Icon. Pl. p. 56, tab. 12, fig. 1), as Maximowicz thinks. Caryopsis is remarkable in having the curious verrucous appendages.

Fimbristylis (*Dichelostylis*) **æstivalis** Vahl.; Nees in Linnæa IX. p. 290; Roem. et Schult. Syst. Veg. II. p. 96, Mant. p. 55; Spreng. Syst. Veg. I. p. 201; Steud. Syn. Pl. Cyp. p. 110; Boeck. in Linnæa XXXVII. p. 11; Kunth Enum. Pl. II. p. 226; F. Muell. Fragm. Phyt. Austral. IX. p. 11; Benth. Fl. Hongk. p. 392, et Fl. Austral. VII. p. 310; Clarke in Hook. fil. Fl. Brit. Ind. VI. p. 637, et in Journ. Linn. Soc. XXXIV. p. 59.

Scirpus æstivalis Retz.; Willd. Sp. Pl. I p. 308; Pers. Syn. Pl. I. p. 69; Roxb. Fl. Ind. I. p. 227.

Fimbristylis Griffithiana Steud. l. c. p. 110.

Fimbristylis Griffithii Boeck. in Flora XLIII. p. 241.

Fimbristylis tricholepis Miq. Fl. Ind. Bat. III. p. 319.

Fimbristylis dichotoma Boeck. in Flora XLII. p. 70, non. Vahl.

Fimbristylis leiocarpa Maxim. Prim. Fl. Amur. p. 301.

Fimbristylis tokyoensis Makino in Bot. Mag., Tokyo, VI. (1892) p. 47 (nomen).

Hab. Prov. MUSASHI: Negishi in Tokyo (*T. Makino!* Sept. 30, 1888), Tokyo (*T. Makino!* 1890), Akabane (*T. Makino!* Oct. 1890), Tabata (*T. Makino!* Aug. 1900); Prov. SHIMOOSA: Mama (*T. Makino!* Oct. 6, 1895); Prov. IWAKI: Mimikai in Fuku-ura-mura (*T. Makino!* Aug. 16, 1890).

This species is distinguished from *Fimbristylis squarrosa* Vahl. by its glabrous basal-bulb of the style, and also by its usually smaller spiculae and less mucronate glume.

Fimbristylis (*Dichelostylis*) **squarrosa** Vahl. **var. esquarrosa** Makino, var. nov.

Spiculae not squarrose, or hardly squarrose. Seta of the glume short, erect, or slightly curved outwards.

Hab. Prov. TOSA: Ikenouchi (*T. Makino!* Aug. 11, 1887), Susaki (*T. Yoshinaga!* 1887); Prov. MUSASHI: Waseda in Tokyo (*T. Makino!* 1890), Fukagawa in Tokyo (*T. Makino!* Aug. 1893), Koiwa-mura (*T. Makino!* Aug. 1893); Prov. SHIMOOSA: Kōnodai (*T. Makino!* Sept. 1894; Herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 1893), Mama (*T. Makino!* Oct. 6, 1895); Prov. KADZUSA: Ichinomiya (*T. Makino!* Aug. 1900); Prov. SAGAMI: Hakone, side of Lake Ashi (*T. Makino!* Sept. 24, 1886); Prov. HITACHI: Takahagi (*T. Makino!* Aug. 12, 1890); Prov. UZEN: Kumaide in Higashitagawa-gōri (*T. Nagasawa!* Aug. 11, 1891).

More common than the typical one in Japan; it resembles *Fimbristylis aestivalis* Vahl., but is easily distinguished from it, by its hairy style.

Juncellus pygmæus (Rottb.) Clarke in Hook. fil. Fl. Brit. Ind. VI. p. 596, (1893), et in Journ. Linn. Soc. XXXIV. p. 18.

Cyperus pygmæus Rottb. Descr. et Ic. Pl. (1786) p. 20, tab. 14, figs. 4-5; Kunth Enum. Pl. II. p. 18; Miq. Fl. Ind. Bat. III. p. 261; F. Muell. Fragm. Phyt. Austral. VIII. p. 268; Benth. Fl. Austral. VII. p. 262, excl. nota; Bœck. in Linnæa XXXV. p. 493, excl. var. β .; Steud. Syn. Pl. Cyp. p. 13; Clarke in Journ. Linn. Soc. XX. p. 282, et XXI. pp. 28-30, 81, tab. 2, figs. 10-10a; Franch. et Sav. Enum. Pl. Jap. II. p. 102.

Pycneus pygmaeus Nees in Linnæa IX. (1834) 283.

Dichostylis pygmæa Nees in Linnæa IX. p. 289.

Cyperus squarrosus Roxb. Fl. Ind. I. p. 190, non Linn.

Cyperus monocephalus Roxb. mss., non Fl. Ind. ex Clarke.

Cyperus Mullen-Pulla Schult. Syst. Veg., Mant. II. p. 99.

Cyperus pugioniformis A. Dictr.

Cyperus Michelianus Delile.

Cyperus hyalinolepis Steud. Syn. Pl. Cyp. p. 316.

Scirpus involucratus Spreng. herb. ex Steud.

Cyperus nipponicus Franch. et Sav. Enum. Pl. Jap. II. (1879) pp. 102, 537.

Juncellus nipponicus Makino in Sched. herb. Sc. Coll. Imp. Univ. Tokyo, (1894).

In Japanese form, attains 4 decim. in height; inflorescence contracted into a head, but often 1-6-radiate; radii divaricate-patent, unequal, about 5 cm. long in the well developed one; spiculæ attaining 10 mm. in length having 32-flowers.

Hab. Prov. MUSASHI: Tokyo (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 3, 1880; *T. Makino!* 1886, Aug. 23, 1888, Aug. 1893, 1894, Sept. 22, 1895); Kaminakazato-mura (*T. Makino!* Aug. 17, 1888), Koiwa-mura (*T. Makino!* Aug. 1893, 1894); Prov. SAGAMI: Hakone (*T. Makino!* Sept. 24, 1886); Prov. RIKUZEN: Sendai (*T. Makino!* Aug. 1890).

***Pycneus unioloides* (R. Br.) Makino.**

Cyperus unioloides R. Br. Prodr. Fl. Nov. Holl. (1810) p. 216; Rœm. et Schult. Syst. Veg. II. (1817) p. 229; Spreng. Syst. Veg. I. (1825) p. 211; Steud. Syn. Pl. Cyp. p. 54; Benth. Fl. Austral. VII. p. 261; Clarke in Journ. Linn. Soc. XXI. p. 60.

Cyperus bromoides Willd. mss.; Rœm. et Schult. Syst. Veg. II. Mant. (1824) p. 130; Kunth Enum. Pl. II. (1837) p. 8; Steud. l. c. p. 6; Bœck. in Linnæa XXXV. p. 463.

Cyperus angulatus Nees (1834); Steud. l. c. p. 12; Bœck. l. c. p. 465.

Pycneus angulatus Nees in Linnæa IX. (1834) p. 283; Clarke in Hook. fil. Fl. Brit. Ind. VI. p. 593, et in Journ. Linn. Soc. XXXIV. p. 17; Makino in Bot. Mag., Tokyo, IX. (1895) p. 258.

Cyperus lanceus F. Muell. Fragm. Phyt. Austral. VIII. p. 259, non Thunb.

Cyperus luteolus Boeck. in Flora LVIII. (1875) p. 82, ex Benth. l.c.
Cyperus tosaensis Makino in Bot. Mag., Tokyo, VI. (1892) p. 47,
 (nomen).

Hab. Prov. Tosa in Isl. Shikoku : Kashiratsudoi (*T. Makino!* Oct. 27,
 1885).

It is rarely found in the warm part of Southern Japan.

Cyperus (Choristachys, Compressi) **Iwasakii** Makino in Bot. Mag.,
 Tokyo, VI. (1892) p. 47.

Estoloniferous, glabrous, attaining about 12 decim. in height. Roots fibrous, dark-castaneous. Culm solitary, or 2-3, robust, elate, nearly 2 cm. in diameter at the basal portion, obtusely trigonous, smooth, green. Leaves basal, 3-4, longer than the culm, long, broadly linear, long-acuminate, aculeato-scabrous on the margin and carina, subcoriaceous, about 6-14 mm. wide, green above, paler beneath, the sheath long and spongy in texture. Umbel usually large, compound or simple, 6-32 cm. long, 11-46 cm. across; radii 5-12, erect-patent, unequal in length, straight, slender, compressed, smooth, the longest one 23 cm.; the basal sheath $\frac{2}{3}$ -4 cm. long, with a terminal subulate lobe; involucrel bracts 3-5, much longer than the umbel, broadly linear, long-acuminate, clasping at the base, aculeato-scabrous on the margin and carina, the lowest one attaining 11 decim. in length; secondary umbel pluri-radiate with erect-patent or divaricate unequal radioles which attain about 7 cm. in length, the basal sheath truncate at the mouth and brown; bracts linear, long-acuminate, usually shorter than the secondary umbel, aculeato-scabrous on the margin throughout and carina above. Spikes 1-7, radiately placed, in the lateral ones erect-patent or patent or subreflexed and shorter than the terminal one, sessile, elliptical to oblong, 2-4 cm. long, 1-1 $\frac{1}{2}$ cm. broad, subdistichously spiculose; rachis slender, narrowly winged, glabrous. Spiculæ numerous, patent, sessile, approximate, oblong-linear, obtuse, complanate, flavescent but viridescens towards the edges, about 24-30-flowered, 7-10 mm. long; bracteoles minute, subulate, acuminate; rachilla glabrous, very narrowly winged. Glumes numerous, distichous, imbricate, erect-patent, oval-orbicular, navicular, subcarinate, rounded and with a mucronate point at the apex, very minutely erosulate on the margin, membranaceous and flavescent, obscurely 5-nerved and broadly green (excepting the lower portion) on the back, 2 mm. long; the lowest glume shorter, oval, 2-carinate, truncato-retuse at the apex. Stamens

3; filament ligulate, glabrous, as long as the style; anther linear, pale-yellow, apiculate at the apex. Style exerted from the glume, slender, ligulate-filiform, compressed, glabrous, slightly thickish towards the base, 3-fid; the branches filiform, $\frac{1}{2}$ as long as the main portion. Caryopsis elliptical, trigonous, smooth, 1 mm. long, pale-stramineous, with sub-persistent style which is longer than the caryopsis.

Hab. Prov. MUSASHI: Tokyo (*T. Makino!* Oct. 1890, Oct. 1893, Sept. 1895).

The largest species among the Japanese *Cyperus*, and is occasionally found growing in pond or ditch in Tokyo. I have named this species in honour of Kwan-yen Iwasaki, the author of well-known "Honzō-Dzūfu" (本草圖譜), a great work on Japanese plants.

It is abundantly cultivated in boggy field as a useful plant in Corea, where a sort of floor mat is made of its culms, according to T. Uchiyama, of the Botanic Garden, Science College, Imperial University of Tokyo, who travelled over that country under the order of the University for the collection of plants in 1902.

Polygonatum nipponicum Makino, sp. nov.

Glabrous throughout, the size of *P. officinale* All. Stem curved, terete, but subsulcate in foliate portion. Leaves alternate, elliptical or oblong-elliptical, obtuse, sessile, green above, glaucous beneath, thin when dried, about 9–12 cm. long, 4–6 $\frac{1}{2}$ cm. broad; main nerves 5; veinlets numerous, forming rectangular spaces between them by their transverse venules. Peduncle 1 to each leaf-axil, cernuous, about 1 $\frac{1}{2}$ –2 cm. long, involucrate at the end, umbellately 2–5-flowered. Involucres 4–5, perianth-like, campanulate, slightly reflexed at the apex, lanceolate, shortly acuminate, entire, thinly membranaceous towards the margin, 1 or sub-3-nerved, green, about 1 $\frac{1}{3}$ cm. long. Flowers pedicellate, the buds included within the involucres.

Hab. Prov. IWASHIRO (*K. Nemoto!*).

Rare. This species is characterized by its perianth-like involucres.

Eritrichium (Eueritrichium) **nipponicum** Makino, sp. nov.

Myosotis sp. herb. Sc. Coll. Imp. Univ. Tokyo, et Cat. Herb. Coll. Sc. Imp. Univ. Tokyo, (1886) Suppl. p. 284.

Perennial, densely caespitose, with about 4–10 stems, hirsute-subcanescent

with adpressed not-hooked white hairs. Tap-root perpendicular, stout, nigrescent. Leaves linear or lato-linear, obtuse, attaining about 5 cm. long, 6mm. wide; cauline ones smaller, alternate, 6-25 mm. long, hairiness as are the radical ones and hairs all adpressed. Stems erect or ascending or diffusely ascending, 5-8 cm. long including the cyme in flower, gracile. Cyme corymbose, about 5-11-flowered, 1-2 $\frac{1}{4}$ cm. across; rachises 2-3, not long, each subtended by a leafy bract; bracteloes few to each rachis, small, shorter than the pedicel, linear, obtuse. Flowers 6-7 mm. across, cæruleous; pedicels erect or erect-patent, 1 $\frac{1}{2}$ -2 as long as the calyx, 3 $\frac{1}{2}$ -4 $\frac{1}{2}$ mm. long, adpressed-pubescent-hirsute. Calyx very deeply 5-parted, pubescent-hirsute with adpressed not-hooked hairs, 2 $\frac{1}{2}$ mm. long; lobes erect-patent, angustato-oblong, obtuse. Corolla hypocraterimorphous, 5-fid; tube short, broad, shorter than the calyx; limb patent, longer than the tube, the lobes 5, elliptical-oval; appendages prominent, emarginate, papilloso-hairy. Stamens 5, included, inserted on the middle of the corolla-tube; filament short, subulato-linear; anther elliptical. Style short, included; stigma depressed-capitate, orbicular. Nutlets obliquely attached to the gynobase, the margin pectinato-spinulose with 1-seriate unequal teeth all round, the dorsal face elliptico-ovate, slightly convex, puberulent.

Nom. Jap. *Miyama-murasaki*.

Hab. Prov. SHINANO: Mt. Togakushi (*R. Yatabe and J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 12, 1884; *T. Yagi!* Aug. 1901).

Echinosperrum (Lappula) **Matsudairai** Makino, sp. nov.

Myosotis intermedia herb. Sc. Coll. Imp Univ. Tokyo, et Cat. Herb. Coll. Sc. Imp. Univ. Tokyo, (1886) Suppl. p. 284, quoad pl. Togakushicam, non Link.

Perennial (?), attaining about 7 decim in height. Stem erect, slender, terete, adpressed-pilose but patent-pilose below, loosely branched above. Leaves sparse, erect-patent or subpatent, oblong-linear, obtuse or acutish, attenuated below, petiolate in the lower ones, pubescent-hirsute, the basal ones subspathulate and long-petiolate, the petiole villosa-ciliated. Racemes erect or erect-patent, bracteate, 3-10cm. long in fruit; rachis slender, adpressed-pubescent-pilose, loosely bearing the fruits; bracts loosely placed, lanceolate, the lower ones equal to the pedicel of fruits but the upper ones shorter than the pedicels and at length becoming minute. Flower small, about 3mm. across, pedicellate; pedicel pubescent-pilose, patent or subdeflexed and

longer than the calyx and 4-5mm. long in fruit, thick at the receptacle. Calyx 5-divided, pilose, ciliated; lobes erect-patent, oblong, acutish, $1\frac{1}{3}$ mm. long in flower, but $1\frac{1}{2}$ mm. and patent in fruit and not exceeding it. Corolla about twice as long as the calyx, infundibuliform-hypocraterimorphous; tube short and broad, campanulate, a little shorter than the calyx; limb slightly longer than the tube, the lobes elliptical-ovate, rounded at the apex, appendages prominent, reniform-lunate. Stamens included, inserted on the middle of the corolla-tube; filament short, gracile; anther elliptical. Style short, erect, included; stigma depressed-capitate. Nutlets about 2mm. long omitting the prickles, depressed-trigonous; the dorsal disk ovato-deltoid, acute at apex, rounded at base, plane, minutely muricate as the lateral faces; marginal prickles 1-seriate, patent, long, very slightly connate at the base, glochidiate at the apex; gynobase pyramidal.

Nom. Jap. *Iwa-murasaki*.

Hab. Prov. SHINANO: Mt. Togakushi (*R. Yatabe and J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 12, 1884, in flowers; *Hitoshi Matsudaira!* Aug. 1893, in fruits).

Rare. I have named it in honour of late Baron Hitoshi Matsudaira, who was a diligent student of botany. This genus is new to Japanese Flora.

Myosotis intermedia Link; Spreng. Syst. Veg. I. p. 558; DC. Prodr. X. p. 108; Ledeb. Fl. Alt. I. p. 187, excl. var. *a.*, et Fl. Ross. III. p. 146; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 438; Less. in Linnæa IX. p. 157; Maxim. in Mém. Biol. VIII. p. 545; Franch. et Sav. Enum. Pl. Jap. I. p. 335; Miyabe Fl. Kuril. Isl. p. 253; Palib. Consp. Fl. Kor. II. p. 16.

Myosotis arvensis Roth; A. Gray in Perry's Exped. Jap. p. 316.

Nom. Jap. *Ezo-murasaki* (nov.).

Hab. Prov. HIDAOKA in Hokkaidō [*Ezo*]: Shidzunai (*K. Miyabe!* herb. Sc. Coll. Imp. Univ. Tokyo, June 14, 1884).

I have not yet seen from Honsiu.

Swertia (*Ophelia*) **Kuroiwai** Makino, sp. nov.

Perennial (?), $1\frac{1}{2}$ -3decim. high, glabrous. Stem erect, foliate below, the upper often with remotely placed small leaves. Leaves opposite,

approximate, spreading, elliptical to oblong, abruptly short-acuminate with a sharp tip, attenuated below into petioles shortly connate at the base, entire and more or less crispate, thickish, subtriplinerved, attaining 15 cm. long including the petiole, and 8 cm. wide; petioles winged, often long. Cyme loosely paniculate, oblong; rachis slender, erect; peduncles opposite, strict, erect-patent, about $\frac{1}{2}$ -2 cm. long; bracts linear, acuminate, shorter or longer than the peduncle; pedicel enlarged above, 1-2 $\frac{1}{2}$ cm. long, with minute subulate bracteoles below. Flower about 1 $\frac{3}{4}$ cm. across, not nutant, pale. Calyx 5-parted, about 4 $\frac{1}{2}$ mm. long; lobes deltoid-subulate, acute, entire, subcarinate, 1-nerved, green, persistent. Corolla deeply 5-parted, campanulato-patent, persistent; lobes spatulato-lanceolate, abruptly short-acuminate, provided with a green large glandular spot above the middle, 10-11 mm. long, the tube very short. Stamens 5, inserted at the top of the corolla-tube, shorter than the corolla-lobes; filament subulato-filiform, glabrous; anther narrowly oblong, yellowish. Ovary ovato-oblong, glabrous, 8 mm. long including the very short style bearing a bilobed stigma. Capsule large, longer than the persistent corolla, narrowly ovoid, acute, crowned with a bifid stigma. Seeds numerous, minute, rounded to elliptical, compressed, muricate.

Hab. 琉球 : Yontanzan in Isl. Okinawa (*H. Kuroiwa!* Dec. 1895).

The leaves are similar to those of *Swertia Tashiroi* (Maxim.) Makino, but the flowers are very different. This is also found in Amami-Ōshima.

Swertia (*Ophelia*) **tosaensis** Makino.

Swertia chinensis var. *tosaensis* Makino in Bot. Mag., Tokyo, VI. (1892) p. 53.

Biennial, glabrous, 8-52 cm. high. Roots divaricate. Stem erect, slender, tetragonous, usually loosely or rarely densely branched; branches slender, ascendingly erect. Leaves spreading, subspathulate or linear-oblong, obtuse or acute, attenuated below into a rather long or short petiole, the superior ones gradually smaller and sessile and lanceolate or linear-lanceolate and passing into lato-linear bracts above, entire, thin, triplinerved, the lower largest one attaining 6 $\frac{1}{2}$ cm. long and 1 $\frac{3}{8}$ cm. wide. Cyme paniculate; bracteoles linear, often shorter than the pedicel. Flowers 1 $\frac{1}{4}$ -1 $\frac{1}{2}$ cm. across, whitish, erect, pedicellate. Calyx 5-divided, glabrous, green; lobes lanceolate, acute, 4-8 mm. long, 3 or sub-5-nerved, with anastomosing venules. Corolla patent, longer than the calyx, deeply

5-parted, 6–10 mm. long; lobes narrowly oblong, obtuse or acutish, entire, delicately 5-nerved; glands 2 to each lobe and situated below, longitudinally oblong or narrowly oblong, fimbriate all round with numerous filiform weak hairs which are much shorter than the lobes. Stamens 5, inserted at the top of the short corolla-tube, shorter than the corolla-lobes; filament subulate, filiform; anther oblong-elliptical. Ovary erect, ovato-oblong, compressed, glabrous, 5–6 mm. long; stigma sessile, bifid. Capsule equal to the corolla in length, oblong, glabrous, crowned with a bifid stigma. Seeds numerous, small, rounded to elliptical, angulate; testa close, minutely reticulate.

Nom. Jap. *Inu-semburi*.

Hab. Prov. TŌSA: Hirakushi-mura (*T. Makino!* Oct. 5, 1885), Tachibanagawa-mura (*T. Makino!* Oct. 21, 1885), Yotsudzi (*T. Makino!* Oct. 20, 1885), Kinzyōno (*T. Makino!* Oct. 21, 1885), Wada near Sukumo (*T. Makino!* Nov. 4, 1885), Hirata (*T. Makino!* Nov. 4, 1885); Prov. OWARI: Tashiro-mura (*T. Makino!* October 29, 1893), Prov. MIKAWA: Takashi-mura (*T. Makino!* October 25, 1893), Atsumi-gōri (*T. Makino!* Oct. 27, 1893); Prov. MUSASHI: Shimura (*T. Makino!* Oct. 30, 1898), Nippori (*R. Yatabe and J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Nov. 5, 1884); Prov. IDZUMI: Kusabe-mura (*S. Matsuda!* herb. *ibid.* Oct. 25, 1896).

Allied to *Swertia chinensis* Hemsl. et Forbes. It grows in muddy place in field, and its roots do not contain the bitter principle.

Swertia chinensis (Bunge) Hemsl. et Forbes in Journ. Linn. Soc. XXVI. p. 139, non Franch. = *Ophelia chinensis* Bunge; *Ophelia diluta* Ledeb.; *Swertia diluta* Benth. et Hook. fil.; *Swertia rotata* Thunb. non Linn.; *Pleurogyne rotata* Sieb. et Zucc. non Griseb.

We distinguish two forms:—

a. vulgaris: stem slender, fastigiately ramose; pedicels slender; corolla white with violascent lines.

b. violacea: stem stouter, taller, attaining 5 decim. in height, ramose above; flowers paniculate, larger, beautifully violaceous, corolla-lobes broader; pedicels short.

Ajuga (*Bugula*) **reptans** Linn. **var. japonica** Makino in sched. herb.

Sc. Coll. Imp. Univ. Tokyo, et in Bot. Mag., Tokyo, XII. (1898) p. 228.

Ajuga decumbens f. *erecta* Savatier in Inuma's Sōmoku-Dzusetsu, ed. 2, XI. fol. 6 recto, no. 5.

? *Ajuga decumbens* γ. *glabrescens* Franch. et. Sav. Enum. Pl. Jap. II. p. 466.

Perennial, 1-4 decim. high, stoloniferous; stolons 1-9, slender, often long, attaining about 4 decim. in length, remotely foliate; rhizome short, erect, or repent, rooting. Stems 1 to 8, erect but the lateral ones ascending, remotely pauci-foliate, villose; the internode long, the longest one 23 cm. Leaves petiolate, erect-patent, oblong, elliptical, ovato-oblong, or ovate, obtuse, sinuate, or repand-sinuate, herbaceous, flaccid, pilosulate or glabrous, veins loose; the petiole short or long; after flowering and fruiting the radical leaves become glabrous and often become much increased in size, attaining 20 cm. in length including the petiole. Spike 4-25 cm. long, simple, erect; verticillasters tri-quinqueflorous, sessile, shorter than bracts, the lower ones remote; rachis villose, the lower internode often elongated; bracts foliaceous, patent, similar to leaves in form but sessile and smaller in size, sinuate or sometimes entire, pilose, often subtriplinerved. Flower very shortly pedicellate. Calyx campanulate, cut down to the middle into 5-cleft lobes, patently villose and ciliated, 5-6 mm. long; lobes subulato-lanceolate, acuminate; the tube many-nerved. Corolla exserted, blue; the tube narrow, 6-7 mm. long, somewhat enlarged at the base; limb labiate, the lower lip patent, 5-6 mm. long, 3-parted, the lateral lobes oblong, obtuse, ciliated, the midlobe broadly obovato-cuneate, emarginate with rotund lobes and a slightly produced tip between the lobes; the upper lip very short, bilobed. Stamens slightly exserted, inserted on the upper portion of the corolla-tube, the lower ones slightly longer; filament slightly pilose; anther subreniform. Style slightly exserted, glabrous, with a bifid stigma; ovary glabrous, the lobes globose. Nutlets elliptical, minutely reticulato-foveolate, yellowish-smoky.

Hab. Prov. SHIMOOSA: Kogane-ga-hara (Herb. ! Sc. Coll. Imp. Univ. Tokyo, May 16, 1880); Prov. MUSASHI: Tokyo (Herb. ! *ibid*; *T. Makino* ! May 1896), Toda-hara (*R. Yatabe and J. Matsumura* ! herb. *ibid.* May 3, 1880); Shimura (*T. Makino* ! May 22, 1898), Kanagawa (*T. Makino* ! April 23, 1890); Prov. SAGAMI: Hiratsuka (*T. Makino* ! Aug. 4, 1895); Prov. SHIMOTSUKE: Nikkō (*T. Makino* ! June and Aug. 27, 1901).

This variety differs from the type, mainly by having the several stems and dense villosity.

Vaccinium longeracemosum Franch. et Sav. Enum. Pl. Jap. II. (1879) p. 425.

Vaccinium Nagurai Makino, ined.

Shrub; branches terete, glabrous, castaneous, innovations pilosulate. Leaves deciduous, obovato-elliptical or elliptical, acute or shortly acuminate with a mucronate tip, acute at base, very shortly petiolate, entire and glabrous or subciliated margined, chartaceous, thinly pilose above, nervate and often thinly muricato-pilose beneath, attaining $4\frac{2}{3}$ cm. long, $2\frac{2}{3}$ cm. broad. Raceme terminal on the short lateral foliate innovations, spreading, subsecundly many-flowered, 3–5 cm. long; rachis slender, thinly pubescent; bracts deciduous, oblong-lanceolate, mucronato-acute, sessile, membranaceous, reticulately nervate. Flowers $4-4\frac{1}{2}$ mm: across; pedicel erect-patent or patulous, glabrous, twice as long as the calyx, $2\frac{1}{2}$ mm. long. Calyx campanulate, glabrous; lobes semiorbiculato-deltoid, subdenticulate or moreover ciliated at the obtuse apex. Corolla lato-campanulate, twice as long as the calyx, 5-fid and cut down one-third; lobes deltoid obtuse, revolute. Stamens 10, included, slightly shorter than the corolla; filament subulato-linear, pilose; anther erect, narrow, straight, dorsifixed, exaristate, slightly shorter than the filament, cells produced above into closely placed erect beaks, each with a pore at the top. Style erect, glabrous, a little exserted; stigma depressed-capitate. Bacca globose, about 1 cm. each way, with the persistent calyx, purple-black. Seeds obliquely elliptical, compressed, fulvous, 2 mm. long.

Hab. Prov. MIKAWA: Ōkubo in Atsumi-gōri (*G. Nagura*! June 1, 1898, flowers); Prov. TŌTŌMI: Mikata-ga-hara (*Z. Umemura*! Oct. 28, 1899, fruits).

This species is allied to *Vaccinium ciliatum* Thunb.

Lychnis (Eulychnis) **kiusiana** Makino, sp. nov.

Perennial, attaining $6\frac{1}{2}$ decim. in height. Stem very slender, rigidly pubescent with retrorse hairs above, nodes slightly turgid, the internodes 2–6 cm. long. Leaves spreading, lanceolate, or narrowly lanceolate, acuminate, narrowed below, sessile, longer or shorter than the internode, glabrous, entire and scabrous margined, thin, 2–5 cm. long, 3–10 mm. wide. Cyme loosely 1–5-flowered; peduncles erect-patent; bracts linear. Flower shortly pedicellate, about 2 cm. across, scarlet. Calyx clavato-cylindrical, glabrous, about 2 cm. long, about 4 mm. in diameter, 10-nerved, veinlets

loosely anastomosing above; lobes erect, short, deltoid or ovato-deltoid, obtuse, ciliated with crisped hairs. Petals 5; limb patent, 10 mm. in length and in width, obovato-cuneate, 4-fid, the interior lobes fimbriate with about 3-4 linear lacinæ, the exterior lobes subulato-linear, acuminate, shorter than the interior lobes, 3 mm. long; scales 2 to each petal, semiorbicular-ovate or emarginate; unguis spatulato-linear, attenuated below, thin, ciliated, 3-nerved, scarcely longer than the limb. Stamens glabrous, longer than the unguis; filament filiform. Ovary oblong, about 7 mm. long; styles 5, longer than the ovary; gynophore slender, about 14 mm. long.

Nom. Jap. *Ogura-sennō* (Inuma's *Sōmoku-Dzusetsu*, VIII. fol. 63 recto, no. 62).

Hab. Prov. HIGO in Kiusiu: Senchōmuda in Aso-gōri (*H. Nakagawa!* Sept. 27, 1896).

I have a specimen of this very rare species, which is due to the kindness of Mr. Hisatomo Nakagawa.

Dianthus (*Carthusianastrum*) **shinanensis** (Yatabe) Makino in sched. herb. Sc. Coll. Imp. Univ. Tokyo, (1899).

Dianthus barbatus var. *shinanensis* Yatabe in sched. herb. Sc. Coll. Imp. Univ. Tokyo, (1892), et in Bot. Mag., Tokyo, VI. (1892) p. 132.

Dianthus Carthusianorum Inuma *Sōmoku-Dzusetsu*, VIII. fol. 24 verso, non Linn.

Perennial, 3-7 decim. high. Stem erect, ascending at the base, slender, terete, usually pubescent-scaberulous above; node elevated; internodes about 2-7½ cm. long. Leaves erect-patent or spreading, longer than the internodes, linear, acuminate with an acutish point, gradually attenuated below into a narrow petiole, glabrous, scabrous-margined, green, 3 or 5-nerved, about 3-9 cm. long including the petiole, 3-7 mm. wide; petiole nervate, dilated and shortly connate at the base. Inflorescence dichotomously short-branched, fasciculately dense-flowered, 3½-7 cm. across, with a flat top; peduncles short; floral leaves linear, or setaceo-linear, scarious on the basal margin, shorter than the flower. Flowers very shortly pedicellate, 12-18 mm. across, purple; bracts 4, shorter than the calyx, oblong or narrowly oblong, long-setaceo-acuminate, narrowly scarious and ciliated margined, setæ scabrous. Calyx narrowly cylindrical, glabrous, finely striate, 5-fid, 16-21 mm. long; lobes erect, unequal in length,

deltoid-subulate, sharply tapering, ciliated, closely 5-9-nerved. Petals 5, long-unguiculate; limb patent, subrhombico-cuneato-orbicular, irregularly denticulate on the front margin, barbulate below, 6-8 mm. long, 5-8 mm. wide; unguis slender, $2\frac{1}{2}$ -3 times as long as the limb. Stamens 10, shorter than petals; filament filiform, glabrous; anther oblong-linear, Styles 2, filiform. Ovary shortly stipitate, cylindrico-oblong, about 6 mm. long. Capsule cylindrical, equal to the calyx in height, about $1\frac{3}{4}$ cm. long. Seed broadly ovate, tapering at apex, compressed, black.

Nom. Jap. *Miyama-nadeshiko*, *shinano-nadeshiko*.

Icon. Inuma's Sōmoku-Dzuseteu, VIII. fol. 25 recto, no. 24 (flowers laxer) sub *Hachijō-nadeshiko* (nom. mala).

Hab. Prov. SHINANO (Herb. ! Sc. Coll. Imp. Univ. Tokyo), Mt. Togakushi. (*T. Inui* ! Aug. 8, 1897), Mt. Shirouma-dake (*Y. Yabe* ! herb. ibid. Aug. 25, 1902); Prov. KAI: Yunoshima (*T. Inui and F. Ashizawa* ! July 1895).

***Dianthus* (Caryophyllastrum) *nipponicus* Makino, sp. nov.**

Dianthus Seguieri Savatier in Inuma's Sōmoku-Dzusetsu, ed. 2, VIII. fol. 24 recto, non Vill.

Perennial, attaining 35 cm. or more in height. Stem erect, but ascending at the base, loosely and strictly ramose, glabrous. Leaves erect-patent, lanceolate, acutish, attenuated below into petioles which are shortly connate at the base, entire, subscabrous and narrowly hyalino-margined, glabrous, thickish, usually shorter than internodes, $2\frac{1}{2}$ -7 cm. long, 5-12 mm. wide. Flower solitary, pedicellate, $2\frac{3}{4}$ -3 cm. across; bracts 4, subadpressed or erect-patent, usually shorter than the calyx, green and thickish above, the outer ones lanceolate, acuminate with an obtuse tip, scabrous on the margin, scarious-margined below, the inner ones shorter than the outer, ovato-lanceolate, attenuated above, scarious-margined below. Calyx oblong-cylindrical, glabrous, striate, about 2 cm. long, 6 mm. across; teeth erect, deltoid-lanceolate, acutish or obtuse, scarious and subciliated margined, 5-nerved, 5-6 mm. long. Petals 5, $3\frac{3}{4}$ cm. long; limb patent, lato-subrhomboid, laciniate with linear acuminate teeth, not barbulate, 11 mm. long, 15 mm. wide; unguis slightly exerted, large, about $2\frac{1}{2}$ as long as the limb, about 25 mm. long, broadly linear, gradually attenuated below, glabrous-margined, with 3 main nerves. Ovary clavato-oblong, about 11 mm. long; styles filiform, about 16 mm. long; gynophore very short.

Icon. Iinuma's Sōmoku-Dzusesu, VIII. fol. 24 recto, no. 23, sub nom. *Hama-nadeshiko*.

Hab. Hokkaidō (*L. Boehmer!* herb. Sc. Coll. Imp. Univ. Tokyo).
Rare. This seems to grow in littoral place.

***Dianthus superbus* Linn var. *monticola* Makino, var. nov.**

Perennial, 15–33cm. in height. Stems erect, but ascending from the obliquely repent rhizome at the base, usually simple or sometimes pauciramose, slender, glabrous, the internodes 2–5½ cm. long. Leaves erect-patent, angustato-linear, acuminate, 4–8cm. long, 1½–3mm. wide, gradually attenuated below, shortly connate at the base, entire, finely scabrous on the margin, 5-nerved, green, not glaucous. Flower often large, solitary, usually pedicellate, 3½–5½ cm. across, pedicel usually 1½–4cm. long, sometimes extremely short, glabrous; bracts 4, erect, the outer ones subulato-linear, or ovato-subulate, narrowly acuminate, shorter or longer than the calyx, scarious-margined below, 10–25mm. long, the inner ones shorter or slightly longer than the outer, elliptical, subulato-acuminate, scarious-margined, 11–14mm. long. Calyx cylindrical, 21–26mm. long, about 5mm. across, glabrous, striate, viridescent often shaded with purple; teeth erect, lanceolate, mucronate, 9-nerved. Petals beautifully deep-rose; limb patent, cuneato-orbicular, deeply fimbriate with narrowly linear long lacinae, barbulate below, 15–26mm. long and wide; anguis exserted, linear, hardly shorter than the limb. Stamens 10; filament filiform, glabrous. Ovary clavato-cylindrical, 8–10mm. long; styles filiform, longer than the ovary; gynophore very short.

Hab. Prov. KAI: Mt. Komagadake (*K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 29, 1895.); Prov. SHINANO: Mt. Togakushi (*T. Yagi!* Sept. 14, 1902.)

This variety is distinguished from the type by its solitary flower as well as the form of its bracts.

***Dianthus chinensis* Linn var. *laciniatus* Körnicke; Fl. des Serres, tab. 1289, 1380; Bot. Mag. tab. 5536.**

Dianthus laciniatus Hort.

Dianthus cincinatus Lem. in Illustr. Hortic. (1864) tab. 388.

Dianthus sinensis var. β . *silvaticus* subvar. *a. macrolepis* lusus 3
Rohrb. in *Linnaea* XXXVI. (1870) p. 672.

Dianthus sinensis c. *silvaticus* subvar. *a. macrolepis* Williams in
Journ. Linn. Soc. XXIX. p. 430, ex parte.

Dianthus chinensis f. *hortensis* Savatier in Inuma's *Sōmoku-Dzusesu*,
ed. 2, VIII. fol. 21 recto.

Nom. Jap. *Ise-nadeshiko*.

Hab. PROV. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*S. Okubo!*
herb. Sc. Coll. Imp. Univ. Tokyo. May 30, 1879), Tokyo, cult. (*T. Makino!*
June 7, 1902).

This is formerly introduced from China, and now mostly cultivated in
the province of Ise.

Melandryum Yanoei (Makino) Williams in *Journ. Linn. Soc.*
XXXII. (1896) p. 187.

Silene Yanoei Makino *Illustr. Fl. Jap.* I. n. 9, (1891) p. 1, tab. 52.

Hab. PROV. TOSA: Mt. Tebako (*S. Yano!* Aug. 10, 1890; *I. Doi!*
Aug. 11, 1892).

This species belongs to the Subgen. II., Sect. *Elisanthe* *Fenzl.*

Sedum (*Seda genuina*) **kiusianum** Makino, sp. nov.

Perennial, densely caespitose, fuscous below, glabrous, about 6cm. high.
Stems numerous, erect, narrow, covered throughout with leaves, but the
lower leaves old. Leaves sparse, numerous, dense, erect-patent or patulous,
lanceolato-linear, acuminate-acute, entire, more or less narrowed below,
apparently subdeltoid-auriculate behind at the base, 6–10mm. long, 1–1 $\frac{2}{3}$ mm.
broad, attached to the stem by the central point above the base, the basal
portion usually purpurascens; main nerves 3, veinlets few, loose, erect-patent.
Cyme about 1 $\frac{1}{2}$ cm. across, dichotomous; branches erect-patent, about
2–3-flowered; bracts leaf-like. Flowers sessile, 1cm. across, yellow. Sepals
5, unequal in length, very shortly connate at the base, linear or
subulato-linear, acutish, one-nerved, green, some of them auriculate
behind at the base. Petals 5, about twice the length of the sepal, linear-
lanceolate, acuminate, shortly connate at the base, 5–5 $\frac{1}{2}$ mm. long. Stamens
10, shorter than the petals; filament subulato-filiform; anther elliptical.
Ovaries 5, lanceolate, long-acuminate into a subulate style; stigma punctiform;

ovules narrowly oblong. Follicles 5, erect-patent, ovato-lanceolate, acute with the style, compressed, the ventral appendages conspicuous. Seeds cylindrico-oblong, bay, minutely granulate.

Hab. Prov. HIZEN in Kiusiu: Mt. Unzen (*A. Satō!* Sept. 10, 1902).

My specimen was kindly sent by Mr. K. Andō, Principal of the Normal School of Nagasaki, prov. Hizen.

Corydalis (*Capnoides*) **japonica** Makino, sp. nov.

Elate, flaccid, glabrous, attaining about 8 decim. in height. Stems caespitose, erect, ascending at the base, flexuous, ramose, foliate, attaining about 7mm. in diameter, the branches all racemiferous. Leaves thinly membranaceous, glaucous-green, but usually darkish when dried, the basal ones long-petiolate but the superior ones short-petiolate; the petiole angustato-vaginate; the blade elliptical but oblong in the upper ones, bipinnatisected, the cauline one attaining about 23cm. in length; primary segments 3-4-jugate, patent or erect-patent, with petioles 3-25mm. long; secondary segments 1-2 or sub-3-jugate, sessile or subpetiolulate, but decurrent in the superior ones, broadly ovate to ovato-oblong, broadly cuneate, 3-9-lobed, 5-35 mm. long, 4-20 mm. broad; lobes rounded or sometimes rounded-obtuse and minutely mucronate at the apex; the basal leaves often with deeply lobate secondary segments. Raceme elongate, attaining 21cm. long in fruit, densely and secondly many-flowered from the base to the top; rachis slender; pedicels gracile, deflexed and 3-6mm. in length in fruit; bracts subulato-linear, acuminate, entire or sometimes minutely pauci-denticulate, sessile, shorter than the pedicel. Flower small, horizontal, pale-yellowish, 9mm. long. Sepals minute, obliquely cordato-reniform, with a deltoid acumen, eroso-dentate, hyalino-membranaceous, nearly twice as long as the calcar, caducous, $1\frac{1}{2}$ mm. long. Petals free below, the upper one 7mm. in length, the lamina orbicular, rounded and mucronate at the apex, concave, subcarinate, the unguis oblong, slightly wider than the lamina, 5-nerved; the lower one slightly longer than the upper one (excepting the calcar), the lamina broadly ovate, mucronate, concave, subcarinate, the unguis angustato-oblong, 5-nerved towards the middle; the lateral (interior) ones slightly shorter than the lower one, spatulato-elliptical, with a rounded apex, long-narrowed below into an unguis, conspicuously winged dorsally above, the wing somewhat excurrent above and decurrent below; calcar $\frac{1}{3}$ as long as the petal, ovato-elliptical,

rounded-obtuse, suddenly contracted near the receptacle. Stamens 6; filaments united into 2 bundles, subulato-lanceolate, attenuated above, hyalino-membraceous, 3-nerved, very shortly 3-fid at the apex; anthers 3 to each bundle of filaments, minute, oblong. Ovary linear, attenuated towards the style; style about $\frac{1}{2}$ as long as the ovary; stigma transverse and curved downwards, remotely with 4 projections. Capsule angustato-linear, crispato-contorted, 20-22cm. long, 2mm. broad; the valves 5-nerved, convex-smooth; style gracile, 3mm. long. Seeds small, subreniform-orbicular, compressed, black, shining, compresso-punctate, $1\frac{1}{3}$ mm. long; caruncle oblong-linear, longer than the seed, $2\frac{1}{2}$ mm. long, obliquely patent.

Hab. Prov. MUSASHI: Mt. Yōkami in Chichibu (*T. Makino!* July 16, 1888), Nakatsugawa in Chichibu (*T. Makino!* July 17, 1888), Ōtaki-mura in Chichibu (*K. Watanabe!* May 30, 1895); Prov. TOSA in Shikoku: Komugiune in Hongawa (*Y. and T. Yoshinaga!* Aug. 1890).

This species is very closely allied to *Corydalis streptocarpa* Maxim. in China, but it differs from the latter principally by the upper petal, the stigma, and the ultimate segments of leaves.

***Tricyrtis affinis* Makino, sp. nov.**

Stem erect, $2\frac{1}{2}$ -13 decim. high, slender, flexuous above, usually simple or sometimes laxly ramose, hirsute with retrorse-patent rigid hairs. Leaves oblong, oblong-lanceolate, or ovato-oblong, shortly acuminate or cuspidato-acuminate, extremely shortly petioled or sessile, rounded and amplexicaul at the base, crispate and scabro-ciliated on the margin, very thinly piloso-pubescent, 5-13 cm. long, 2-6 cm. wide, usually longer than the internodes, 7- sometimes 9-11-nerved, the basal ones usually spatulato-obovate or oblong, cuspidate, embraced with the attenuated base, pale green, densely or laxly blotched with dark-green round coarse spots. Flowers terminal and axillary, the terminal ones 1-4, the axillary ones 1-2, pedicellate, 25-28 mm. across; the common rachis very short; pedicels strict, piloso-pubescent with patent hairs, 1-2 cm. long; bracts scaly, subulate. Perianth recurved-patent, white and loosely maculate with purple spots, or rarely immaculate, about 14-18 mm. long; the outer ones oblong or oblong-lanceolate, mucronate, thinly pilose externally, thick and gibbose and pilose at the base; the inner ones narrower, linear-lanceolate, mucronate, subhastato-lobed near the base, sessile and shortly acute at the base. Stamens longer than the perianth, recurved above;

filament subulato-filiform, glabrous but papilloso-pubescent at the base; anther elliptical. Ovary glabrous, narrow, attenuated above, trigonous, many-ovuled; style trifid, the branches recurved-patent, dichotomously cut down one-half, maculate with purple spots and protuberant-glandular. Capsule trigonous, narrow, attenuated above, glabrous, dehiscing above, 23-27mm. long. Seed obovate, compressed, brown, scalariform-reticulated in the faces.

Hab. Prov. TOSA: Mt. Tebako (*T. Makino!* Aug. 1885), Sakawa (*T. Makino!* 1885, 1889), Kusugami (*T. Makino!* Oct. 1892); Prov. SHINANO: Mt. Usuhi-tōge (*T. Makino!* Sept. 1888); Prov. ECHIGO: Mt. Shimidzu-tōge (*T. Makino!* Sept. 1888); Prov. SHIMOTSUKE: Nikkō (*T. Makino!* Aug. and Sept. 1901), Near Ashio (*T. Makino!* Sept. 1901); Prov. MURASHI: Mt. Takao (*T. Makino!* April 1903).

A wide-spread species. Intermediate between *Tricyptis hirta* Hook. and *T. macropoda* Miq., having a closer affinity with the latter species.

Tæniophyllum aphyllum Makino Phanerog. et Pterid. Jap. Illustr.

I. tab. 11, (1899).

Sarcochilus (Chiloschista)? sp. Makino in Bot. Mag., Tokyo, I. (1887) p. 75, tab. 10.

Sarcochilus aphyllus Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. (1892), p. 48.

Cryptorchis aphylla Makino in Bot. Mag., Tokyo, VII. (1893) p. 118, et IX. (1895) p. 231.

A small aphyllous epiphytic orchid, attaining about 7cm. across. Roots many, attaining about 25 in number, emitting from the inconspicuous stem, somewhat compressed, simple, sinuato-flexuous, glabrous but often minutely hairy on the under side, pale green. Stem erect, short, attaining about 4mm. long, provided with pale-brown thin minute subulate scales at the top. Scapes 1 to several, 4-8mm. long, capillary, glabrous, simple, 1-3-flowered; rachis short, flexuous; bracts minute, deltoid-subulate, navicular, acute, carinate, $\frac{1}{2}$ -1 mm. long. Flower minute, 1mm. long, inconspicuous, greenish. Perianth thickish, connate below, not patent; segments subulato-lanceolate or ovato-deltoid, delicately 1-nerved to each segment, the outer ones acutish, the inner ones acute and slightly shorter than the outer. Labellum included, slightly concave, free from the perianth, subtrilobed, the lateral lobes small, subsemiorbicular, inflexed, the midlobe much larger, subulato-deltoid or subulato-lanceolate, furnished with a refracted filiform appendage which is

nearly equal to the midlobe itself in length. Calcar short, saccate, rounded at the end. Gynostemium very short, stout, connected to the calcar and labellum in front. Anther 2-celled, with a groove externally, the front-projected portion parted into 2 rounded lobes; pollinia 4, in two pairs, clavate, sessile on the gland. Ovary cylindrico-subobovate or cylindrico-oblong, glabrous, very shortly pedicellate. Capsule oblong, usually somewhat curved, $3\frac{1}{2}$ –5 mm. long, very shortly pedicellate, dehiscing on one side. Seeds numerous, very minute, cylindrical, about $\frac{1}{3}$ mm. long, mixed with white delicate threads. Flowers June.

Hab. PROV. TOSA: Sakawa (*T. Makino!* 1885), Ikenouchi-mura (*T. Makino!* April 7, 1887), Kōchi (*T. Makino!* July 1892, June 1893, Nov 1895); PROV. AWA (BōSHU): Mt. Kiyosumi (*T. Makino!* Aril 6, 1896); PROV. MUSASHI: Ikegami (*T. Makino!* June. 2, 1895).

An inconspicuous Orchid, allied to *Taniophyllum Alwisii* Lindl. of Ceylon. It grows on *Pieris japonica* D. Don, *Ilex pedunculosa* Miq., *I. crenata* Thunb., *Vaccinium bracteatum* Thunb., *Ternstroemia japonica* Thunb., *Photinia glabra* Maxim., *Prunus pseudo-Cerasus* Lindl., and *Pinus densiflora* Sieb. et Zucc., and is constantly destitute of leaf. In this country it is called *Kumo-ran*, meaning Spider Orchid, from the general appearance of the plant having a resemblance to a resting spider with his feet spread.

Asperula trifida Makino Illustr. Fl. Jap. I. n. 11, (1891) p. 2, tab. 68.

Perennial, 1–4 decim. high. Rhizome slender, long-creeping, rooting at the nodes. Stems erect, slender, tetragonous, smooth and glabrous even on the angles, pilose at the nodes. Leaves 4–rarely 5–verticillate, spreading, very shortly petiolate, elliptical-oblong, mucronato-obtuse or acutish, acute at the base, membranaceous, antrorsely spinuloso-ciliated, thinly pilose towards the margin above, attaining 17 mm. long, 8 mm. wide, the midrib antrorsely pilose beneath. Cyme corymboso-paniculate, $1\frac{1}{2}$ –20 cm. long; branches erect-patent; peduncles twice tri- or dichotomous, glabrous, erect-patent, or sometimes soon divaricate after flowering; bracts linear-oblong; bracteoles usually shorter than the pedicel. Flowers pedicellate, small, $2\frac{1}{2}$ mm. across, white; pedicels gracile, slightly longer or shorter than the flowers. Corolla 3–rarely 4-fid; lobes erect-patent, ovate, obtuse, 3-nerved. Stamens 3, rarely 4, inserted on the upper

portion of the corolla-tube ; filament short, filiform ; anther ovato-elliptical. Style erect, scarcely shorter than the corolla-tube, 2-fid at the top ; stigma capitate. Fruit glabrous, mericarp elliptico-oval, 1 mm. or a little more long.

Hab. Prov. TOSA : Nanokawa (*T. Makino!* Nov. 1884, June 1885) ; Prov. IYO : Oda-yama in Kami-ukena-gōri (*K. Okudaira!* Aug. 1892) ; Prov. SURUGA : Mt. Fuji (*S. Matsuda!* July 1891 ; *S. Yano!* 1891 ; *T. Makino!* Aug. 15, 1899).

A montigenous species.

Galium tokyoense Makino *Illustr. Fl. Jap. I. n. 11, (1891) p. 2, tab. 69.*

Galium Aparine var. *spurium* Maxim. in litt. non Ledeb.

Perennial, attaining 7 decim. in height, darkish in drying. Rhizome slender, branched, rooting at the nodes. Stems erect, slender, erect-patently ramose above, quadrangular, retrorsely muricate on the angles ; Leaves 6-verticillate, patulose, linear-oblongeolate or narrowly oblong, rounded-retuse and minutely apiculate, gradually attenuated below, retrorsely spinuloso-strigose on the margin, attaining $3\frac{1}{2}$ cm. long, 9 mm. wide, the midrib prominent and retrorsely pilose beneath. Cymes corymbose, terminal and lateral ; trichotomously peduncled ; peduncles erect-patent, but divaricate in fruit ; bracts and bracteoles spathulato-linear-oblong. Flowers numerous, small, 3 mm. across, pure white ; pedicels gracile, slightly shorter than the flower. Corolla patent, 4-parted ; lobes ovato-elliptical, acute or acutish. Stamens 4, short ; filament filiform, longer than the oval anther. Styles 2, stigma capitate. Fruits glabrous, mericarp oval-elliptical, about 2 mm. long. Flowers May-June.

Hab. Prov. MUSASHI : Koiwa-mura (*T. Makino!* May 25, 1884, June 23, 1895), Ōmiya in Wada-mura (*T. Makino!* June 3, 1888), Toda-hara (*T. Makino!* June 10, 1888).

Common in fields of the environs of Tokyo.

Galium japonicum Makino in *Bot. Mag., Tokyo, IX. (1895) p. 311.*

Perennial, flaccid, blackish in drying in flower, $1\frac{1}{2}$ -3 decim. high. Roots finely fibrous. Stems caespitose, many, erect, but procumbent-ascending and often rooting at the base, usually simple, usually smooth or some-

times very slightly muricate on the angles, shining, pilose at the nodes, the internodes slender. Leaves 6-(or 5-4 rarely 7-) verticillate, patent or erect-patent, shortly petiolate, elliptical-lanceolate, oblong, narrowly oblong, or lanceolate, cuspidato-acute or cuspidato-obtuse, acute at the base, attaining 25 mm. long, 11 mm. wide, the lower ones smaller and ovato-elliptical or linear-lanceolate, glabrous but finely antrorsely scabro-ciliated and sometimes thinly pilose towards the margin, membranaceous, 1-nerved, with loose veins, the midrib glabrous. Cyme terminal, 1-1½ cm. across; peduncles twice di- or trichotomous, erect-patent, but lengthened and divaricate in fruit, glabrous; bracts and bracteoles linear or lanceolate, the latter often minute. Flowers small, about 3 mm. across, pure white, pedicellate; pedicels 2-3, erect-patent and 1½-3 mm. long in flower, divaricate in fruit. Corolla erect-patent, 4-parted; lobes ovato-elliptical, acutish, 1½ mm. long. Stamens 4, short; filament incurved; anther minute. Styles 2, short, erect-patent; stigma capitate. Ovary globose, densely hispid with unciniate white hairs. Fruit densely uncinato-hispid. Flowers May.

Hab. Prov. Tosa: Mt. Yokogura (*T. Makino!* May 6, 1889, May 1892), Mt. Tebako (*T. Makino!* Aug. 1885), Nanokawa (*T. Makino!* Nov. 1884, June 1885); Prov. Iyo: Mt. Nakatsumyōzin (*K. Okudaira!* May 1895), Nametoko (*Z. Umemura!* May 4, 1894); Prov. HITCHI: Mt. Tsukuba (*T. Makino!* May 27, 1900); Prov. Ugo: Kwan-onzi-mura (*I. Satō!* June 1892).

In general habit this species resembles *Asperula odorata* Linn., the flower, however, is very different from it, and the leaves in a whorl are also less.

Galium trachyspermum A. Gray in Perry's Exped. Jap. II (1859) p. 313, et Bot. Jap. p. 393; Miq. Prol. Fl. Jap. p. 276, excl. var.; Franch. et Sav. Enum. Pl. Jap. I. p. 214, et II. p. 394.

Galium rotundum (*rotundifolium*) Thunb. Fl. Jap. p. 59.

Galium gracile Maxim. in Mém. Biol. IX. p. 261, et XI. p. 802, pro parte.

Perennial, attaining 6 decim. high. Stems densely several-many caespitose, erect, slender, tetragonous, smooth even on the angles, internodes long. Leaves 4-verticillate, erect-patent, ovate, ovato-oblong, or oblong, acute or acutish or obtuse, nearly sessile or very shortly petiolate, piloso-ciliated, patent-antrorsely pilose beneath, attaining 20 mm. long, 8 mm. broad, 1-nerved, subtriplinerved at the base. Cymes small, axillary and

terminal; peduncles not long, compactly few to subnumerous-flowered. Flowers minute, $1\frac{1}{2}$ mm. across, pale-viridescent, pedicellate; pedicels usually shorter than the fruit, divaricate in fruit, glabrous. Corolla patent, 4-parted, glabrous; lobes ovate, simply acute. Stamens 4, short. Styles 2, minute; stigma capitate. Fruit densely squamuloso-pilose with ascending subuncinate short hairs, $1\frac{1}{3}$ mm. long.

Hab. Prov. TOSA: Kusaka (*T. Makino!* 1885), Ōmoto in Ogawa-mura (*T. Makino!* May 18, 1889), Nanokawa (*K. Watanabe!* May 20, 1889); Prov. MUSASHI: Tokyo (*T. Makino!* May 1896), Dōkwan-yama (*T. Makino!* June 1898), Shibuya (*T. Makino!* May 27, and June 5, 1899, June 14, 1900); Prov. ISE: TSU (*Z. Umemura!* May 21, 1894); Prov. OSHIMA in Hokkaidō: Fukuyama (*K. Miyabe!* July 19, 1890).

A very wide-spread species.

Galium gracilens (A. Gray) Makino.

Galium trachyspermum var. *gracilens* A Gray Bot. Jap. (1859) p. 393; Miq. Prol. Fl. Jap. p. 276.

Perennial, attaining $5\frac{1}{2}$ decim. or more long. Stems caespitose, often dense and numerous, erect, often very slender, tetragonous, smooth, internodes long. Leaves 4-verticillate, erect-patent or patent or more or less reflexed, linear-lanceolate, or lanceolate, or oblong-lanceolate, acute, tapering below, sessile or very shortly petiolate, antrorsely piloso-ciliated, very thinly pilose above, pilose on the midrib beneath, attaining 14 mm. long, $4\frac{1}{2}$ mm. wide, sometimes 20 mm. long, 6 mm. wide, the basal leaves shorter and ovate or elliptical. Cymes lateral and terminal, small; peduncles gracile, not long; bracts linear or broadly linear; bracteoles often minute. Flowers minute, pale viridescent, 1 mm. or a little more across, pedicellate; pedicels gracile, filiform, glabrous, often longer than the fruit, often divaricate in fruit. Corolla patent, 4-parted, glabrous; lobes ovate, simply acute or acutish. Stamens 4, short; filament filiform. Styles 2, connate one-half below; stigma capitate. Fruit densely squamuloso-pilose with ascending subuncinate short hairs, 1 mm. long.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1885), Okasaki in Sakawa (*T. Makino!* May 18 and 21, 1889), Ogawa-mura (*T. Makino!* May 18, 1889), Kusaka (*T. Makino!*), Ochi (*T. Makino!* 1892), Nanokawa (*T. Makino!* June 1885), Ishii near Kōchi (*T. Makino!* May 1893); Prov. IYO: Hatadera in Onsen-gōri (*K. Okudaira!* May 1894); Prov. MIKAWA:

Sakamoto in Hoi-gōri (*G. Nagura!* May 1, 1897); Prov. MUSASHI: Hori-nouchi (*F. Makino!* June 3, 1888), Sentagaya (*T. Makino!* May 27, 1899), Shibuya (*T. Makino!* June 5, 1899); LOOCHOO: Shuri in Isl. Okinawa (*H. Kuroiwa!* 1896), Kunchan (*H. Kuroiwa!* May 1897).

A common species, widely distributed over Japan.

Galium setuliflorum (A. Gray) Makino (sensu latiore).

Perennial, $1\frac{1}{2}$ – $8\frac{1}{2}$ decim. high. Stems caespitose, erect or ascending, slender, simple or loosely ramose, tetragonous, smooth even on the angles, rarely patently pilose, pilose at the nodes, internodes slender. Leaves all 4-verticillate and the two smaller, patent or reflexed, lanceolate or angustato-lanceolate, or sometimes linear-oblong, acute or acuminato-acute at the apex, acute at the base, subsessile or very shortly petiolate, antrorsely piloso-ciliated, subpatent-antrorsely pilose on the midrib beneath, very thinly pilose towards the margin above, often subtriplinerved at the base, the largest one about 28 mm. long and 7 mm. wide, the basal ones ovate or orbiculato-ovate and conspicuously petiolate. Cymes terminal and lateral, with gracile and usually trichotomous peduncles, often forming together a loose panicle; bracts linear or linear-lanceolate; bracteoles often minute. Flowers small, pedicellate, $2\frac{1}{2}$ –3 mm. across, usually purplish; pedicels di- or trichotomously arranged, erect-patent, gracile, filiform, usually glabrous, 2–9 times of the fruits in length. Corolla 4-parted, reflexed-patent; lobes ovate or elliptical-ovate, acute and with a beak at the apex (the beak obtuse at the end), glabrous or setuloso-hirsute with stiff long and persistent hairs externally. Stamens 4, short; filament filiform, glabrous; anther rounded. Styles 2, connate one-half below; stigma capitate. Fruits $1\frac{1}{3}$ mm. long, densely squamuloso-pilose with subuncinate ascending short hairs. Flowers May.

This species grows on mountains or wooded hills. It is to be distinguished into two varieties as following, viz.

a. setuliflorum (A. Gray) Makino.

Galium trachyspermum var *setuliflorum* A. Gray Bot. Jap. (1859) p. 393; Miq. Prol. Fl. Jap. p. 276.

Galium pogonanthum Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 213, et II. p. 393.

Galium gracile Maxim. in Mém. Biol. IX. p. 261, et XI. p. 802, pro parte. Corolla-lobes setuloso-hirsute externally.

Hab. Prov. IYO: Yunoyama-mura in Onsen-gōri (*K. Okudaira!* May 1894); Prov. YAMATO (*K. Tsuzi!* 1891).

β . **nudiflorum** Makino.

Galium gracile var. *pogonanthum* Maxim. in litt.

Corolla-lobes quite glabrous.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1884, 1885), Okasaki in Sakawa (*T. Makino!* May 18, 1889), Kōsuizi (*T. Makino!* 1885), Nanokawa (*T. Makino!* June 1885), Near Susaki (*Y. Yoshinaga!*); Prov. TSUSHIMA (*K. Hirata!* June 12, 1902).

Galium asprellum Michx. β . **lasiocarpum** Makino.

Galium davuricum β . *fructu hispido* Maxim.

Galium asprellum a. *typicum* Maxim. in Mém. Biol. IX. p. 262; Franch. et Sav. Enum. Pl. Jap. I. p. 215.

Flowers viridescient, not white. Fruit uncinato-hispid. Leaves attaining $3\frac{1}{2}$ cm. long, $1\frac{1}{2}$ cm. broad.

Hab. Prov. SHIMOTSUKE: Nikkō (*T. Makino!* July 30, 1884); Prov. MUSASHI: Ōtsuka in Tokyo (*T. Makino!* Sept. 1886), Dōkwan-yama (*T. Makino!* Aug. 17, 1888); Prov. SHIMOOSA: Kōnodai (*T. Makino!* May 25, 1884); Prov. UGO: Kwan-onzi-mura (*I. Satō!* June 1892); Prov. ISE: Yachi-mura (*Z. Umemura!* Aug. 24, 1894); Prov. TOSA: Mt. Tebako (*T. Makino!* Aug. 1885), Mt. Yokogura (*T. Makino!* Aug. 28, 1887).

Galium Aparine Linn. forma **leiocarpum** Makino.

Fruits quite glabrous.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1889).

This form occasionally occurs.

Asplenium capillipes Makino, sp. nov.

A pygmæous fern, often proliferous on the frond. Caudex short, erect, with fine fibrous roots below, clothed with scales at the top; scales small, subulato-lanceolate, acuminate, subdenticulate, brown, 1-2 mm. long, with fine but conspicuous venules. Stipes caespitose, spreading, 5-36 mm. long, capillary, deep green, thinly dispersed with very minute scales under lens as is the rachis. Frond ovate to oblong, 5-30 mm. long, 3-15 mm.

wide, not thick, deep green, thinly scattered with very minute scales under lens, bipinnatifid or subbipinnate; rachis capillary, deep green. Pinnæ patent, alternate or opposite, 1-6 on each side, very shortly petiolulate, rounded-ovate, obliquely lato-cuneate at the base, 1-3-pinnuled or 1-4-fid, 2-8 mm. long and wide; pinnules entire or 2-3-fid, often broadly cuneate; ultimate lobes erect-patent, elliptical to oblong, entire, obtuse with a minutely cuspidate tip, or acute, about $1\frac{1}{2}$ mm. across, 1-nerved. Sori elliptical to oblong, straight, 1 to each lobe; indusium thinly membranaceous, subentire, persistent. Sporangia when mature brown and covering the main portion of pinnæ beneath.

Hab. Prov. IYO: Mt. Fudzinoishi-goe (*Y. and T. Yoshinaga!* Aug. 5, 1890); Prov. SHIMOTSUKE: Mt. Kō-shin (*T. Makino!* Sept. 12, 1901).

This is found on mossy rocks of mountains. It has a resemblance to the small form of *Asplenium varians* Hook. et Grev., which also appears in Japan, differing from it by the form of its pinnules and segments, and its proliferous habit.

Nephrodium monticola Makino in Rot. Mag., Tokyo, XIII. (1899) p. 80.

CORRECTIONS. Caudex (p. *ibid.*), for "oblique" read: repent, covered with scales. Stipes (p. *ibid.*), for "cæspitose" read: approximately placed towards the apical end.

ADD. *Hab.* Prov. ECHIGO: Mt. Shimidzutōge (*T. Makino!* Sept. 1888); Prov. SHIMOTSUKE: Nikkō (*T. Makino!* June and July 1900, Sept. 1901).

Phegopteris crenuloserrulata Makino, nom. nov. = *Athyrium crenuloserrulatum* Makino in Bot. Mag., Tokyo, XIII. (1899) p. 26.

CORRECTION. Indusium (p. *ibid.*), for "deciduous" read: none.

ADD. *Hab.* Prov. ECHIGO: Mt. Myōkō (*K. Watanabe!* July 18, 1897); Prov. SHIMOTSUKE: Nikkō (*T. Makino!* June and July 1900, Sept. 1901).

Polypodium lineare Thunb. var. **caudatum** Makino, var. nov.

Rhizome repent, with scars of old stipes; scales small, subulate, acuminate, irregularly denticulate, fuscous-brown. Fronds persistent, few to several, approximately scattered, lanceolate to linear-lanceolate, often

caudately prolonged above with an obtuse tip, narrowed gradually and decurrent below, apparently petiolate, irregularly obscurely subrepand, chartaceo-subcoriaceous, glabrous, 8–26 cm. long, 1–2 $\frac{2}{3}$ cm. broad; midrib slender, prominent on both sides; main veins not distinct, not reached to the margin; veinlets forming oval to narrow-oblong and angular areolae including a simple or divaricately bifurcate free venule with a minute tubercle at the end; petiole 1–4 $\frac{1}{2}$ cm. long. Sori absent in the lower portion of the frond, one-seriate on each side and arranged nearer the midrib than the margin, a little distant from one another, 2–4 cm. across, covered with irregularly denticulate peltate scales when young.

Hab. Prov. TOSA: Mt. Hōnokawa (*Y. Yoshinaga!* Aug. 10, 1887; *T. Makino!* Aug. 10, 1887, Aug. 1889.)

This differs from the typical one by the thinner and much broader frond, having a resemblance to *Polypodium annuifrons* Makino, from which it is often hardly distinguishable in dried specimens, but the frond is persistent and often long-tailed at the apex.

Nephrodium lacerum (Thunb.) Baker *a. typicum*.

Scales of the stipes and rachis ferrugineo-rufous or sometimes fusco-ferruginous. Frond elliptical to oblong; pinnae 10–15 on each side; the soriferous portion contracted. Sori closely placed, occupying in the upper third of the frond.

Hab. Prov. TOSA: Sakawa (*T. Makino!*), Mt. Yokogura (*T. Makino!* Aug. 28, 1887); Prov. HITACHI: Mt. Tsukuba (*T. Makino!* May 27, 1900); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino!* June 1899, Oct. 1900).

β. uniforme Makino.

Scales fusco-rufous in the stipe and fuscous in the rachis, or sometimes all ferrugineo-rufous. Fronds usually larger than those of the *typica*, oblong to oblong-lanceolate, attaining about 6 decim. in length; pinnae numerous, 16–22 on each side; the soriferous portion not contracted. Sori occupying in the upper half or more of the frond, a little laxly placed.

Hab. Prov. TOSA: Sakawa (*T. Makino!* Aug. 20, and Sept. 7, 1887, May 26, 1889); Prov. SAGAMI: Hakone (*T. Makino!* Oct. 6, 1886); Prov. MUSASHI: Ikegami (*T. Makino!* 1886), Tokyo (*T. Makino!* May 1897), Dōkwan-yama (*T. Makino!* June 1898), Shimura (*T. Makino!* Oct. 1901.)

Hypericum (Euhypericum) **tosaense** Makino, sp. nov.

Perennial, glabrous, attaining about 57 cm. in height. Stem woody, erect, slender, strict, terete, smooth, alternately provided with fine elevated lines on two sides throughout. Leaves obovato-oblong, or narrowly oblong, rounded-obtuse, shortly attenuated below and suddenly obtuse at the base, narrowly revolute on the margin, sessile, firm in texture, about $\frac{1}{3}$ –2 cm. long, numerous and minutely pellucid-punctate, the midrib and veins (usually 2 or sometimes 3 on each side) prominent beneath, the lower leaves fallen off in flower. Inflorescence ramose, cymes densely flowered; bracts small, the upper ones minute and subulato-ovate or subulato-lanceolate. Flowers $1\frac{1}{2}$ – $1\frac{3}{4}$ cm. across, bright yellow; pedicels much shorter than the flowers. Sepals 5, rhombico-oval-ovate or rhombico-oval-elliptical, shortly acuminate, loosely nigro-punctate on the margin, thickish, $2\frac{1}{2}$ –3 mm. long in flower. Petals 5, patent, oblong, somewhat oblique, shortly attenuated at the base, obtuse, about 1 cm. long. Stamens numerous, hardly triadelphous, shorter than the petal, about $7\frac{1}{2}$ mm. long; filament filiform, delicate; anther minute, rounded. Ovary ovoid-conical, trisulcate, 3 mm. long, 3-locular; styles 3, slender, longer than the ovary, spreading or erect-patent; stigma capitellato-punctiform; ovules many, minute, oblong. Capsule ovoid-conical, trisulcate, more longer than twice the persistent calyx, 7 mm. long. Seeds many, dark, cylindrical-oblong, minutely punctato-subreticulate, 1 mm. long.

Hab. Prov. Tosa: Ikku-mura (*T. Makino!* Sept. 27, 1892).

This species has the general habit of *Hypericum erectum* Thunb., but evidently differs from it by the tapering sepals and pellucid-punctate leaves. It grows in sunny places on hills.

Hypericum (Euhypericum) **obtusifolium** Makino, sp. nov.

Hypericum erectum var. *obtusifolium* Blume Mus. Bot. Lugd.-Bat. II. p. 25, teste Maxim.; Maxim. in Mém. Biol. XI. p. 168.

Hypericum flaccidum Makino in Bot. Mag., Tokyo, XIII. (1899) p. 241 (nomen tantum).

Perennial, flaccid, glabrous. Stems caespitose, ascending or diffusio-ascending, slender, terete, smooth, ramose, the well developed one attaining about $6\frac{1}{2}$ decim. in length. Leaves oblong, rounded-obtuse, usually rounded or obtuse at the base, sessile or subsessile, membranaceous, very slightly glaucous beneath, minutely nigro-punctate on the margin, dispersedly pellucid-punctate, attaining $3\frac{1}{4}$ cm. long, $1\frac{3}{8}$ cm. wide; veins loose, 3 on

each side. Cymes loose, few-pluri- or sub-numerous-flowered, the branches sometimes secundly flowered; bracts leafy. Flower very shortly pedicellate, about 10–13 mm. across, yellow. Sepals 5, unequal in size, the smaller ones linear-lanceolate, the larger ones foliaceous and oblong to elliptico-oblong and subcrispate, obtuse, green, minutely nigro-punctate on the margin, 3–5-nerved. Petals, 5, patent, thin, spathulato-oblong or narrowly oblong, rounded or obtuse at the apex, slightly longer than the smaller ones of the sepals, about 6 mm. long. Stamens many, shorter than the petals, sets not distinct; filament filiform; anther broadly rounded. Ovary ovoid, glabrous, 3–rarely 4-sulcate, 3–rarely 4-locular, 3 mm. long; styles erect, narrow, equal to the ovary in length; stigma capitellato-punctiform. Capsule globoso-conical, turgid, 3–rarely 4-sulcate, usually a little longer than the persistent calyx, with the persistent styles, about 8 mm. long, 6 mm. across, carpels thinly coriaceous. Seeds numerous, cylindrico-oblong, brown, minutely subreticulate, about $\frac{4}{5}$ mm. long.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1884, Sept. 7, 1887), Fukui near Kōchi (*T. Makino!* 1885), Kamibun (*T. Makino!* Sept. 1892), Mama (*T. Makino!* Sept. 1892), Kōchi (*T. Makino!* Aug. 1892), Niida and Kure (*T. Makino!* Aug. 1, 1889); Prov. MUSASHI: Tokyo (*T. Makino!* Aug. 23, 1888), Shimura (*T. Makino!* Sept. 1893, May 22, 1898); Prov. SHIMOOSA; Mama (*T. Makino!* 1900); Prov. MIKAWA: Kaminagara (*G. Nagura!* Aug. 1, 1897).

This grows in field, and has an affinity to *Hypericum hakonense* Franch. et Sav., which is found on mountains. It differs specifically from *H. erectum* Thunb.

Viola (Nomimium) **Okuboi** Makino, nom. nov.

a. typica.

Viola Keiskei β. *Okuboi* Makino in Bot. Mag., Tokyo, XVI. (1902) p. 133.

Viola Keiskei herb. Sc. Coll. Imp. Univ. Tokyo, non Miq.

Acaulescent, flaccid, not stoloniferous; trunk thick, attaining 9 mm. in diameter, and $2\frac{3}{4}$ cm. in length, short, erect, or sometimes obliquely erect, inarticulated, the surface rough with small protuberances; vagine few, trifid, viridescens; main roots few, elongate, with fine rootlets. Leaves densely caespitose, erect-patent, petiolate, ovato-reniform or reniform-orbicular, rounded-obtuse, cordate with an open sinus, crenato-serrate

thinly piloso-pubescent, thin, quite green, 1–5 cm. long, 1–4 cm. broad, but attaining 7 cm. long, 6 cm. broad after anthesis; veins 3–4 on each side, loose; petiole usually longer or sometimes shorter than the blade, narrowly marginate, thinly piloso-pubescent with patent white hairs, attaining about 13 cm. long after anthesis; stipules adnate one-half below, membranaceous, green, the free portion subulate or subulate-linear, acuminate, erect, dentato-ciliated. Peduncles few to several, higher or lower than the leaves, thinly piloso-pubescent or subglabrous, bracteate at the middle or above or below it, attaining about 10 cm. long in flower, often purplish; bracts 2, erect, linear, ciliated or subciliated, 7–11 mm. long. Flower about 2 cm. across, white, but darkish-flavescent when dried. Sepals lanceolate or oblong-lanceolate, acutish or obtuse, green or purplish-green, trinerved, 7–13 mm. long including the basal auricles, often thinly piloso-pubescent externally, often ciliated on the basal margins; the basal auricles subdeltoid-ovate, irregularly pauci-dentate, often ciliated. Petals obovato-elliptical or obovato-oval or obovato-oblong, rounded at the apex, attenuated below, beardless, 13–14 mm. long, the lower one slightly shorter, striped with violet or sometimes entirely white; calcar oblong or oblong-cylindrical, rounded at the top, horizontal, straight or curved upwards, 5–10 mm. long. Anther-appendages angustato-linear; connective-tip deltoid-ovate or lato-ovate, obtuse. Ovary ovoid-elliptical, glabrous; style a little longer than the ovary, clavate, slightly geniculate at the base; stigma obovate, shortly beaked. Capsule elliptical, obtuse at the top, 8–9 mm. long, glabrous, equal to or longer than the persistent calyx. Seeds obovoid, smooth, brown, $1\frac{1}{2}$ mm. long. Flowers April.

Nom. Jap. *Ke-marubasumire*.

β. glabra Makino.

Viola Keiskei herb. Sc. Coll. Imp. Univ. Tokyo, et Cat. Herb. Coll. Sc. Imp. Univ. Tokyo, (1886) p. 17, non Miq.

Viola Keiskei a. typica Makino in Bot. Mag., Tokyo, XVI. (1902) p. 132, excl. syn.

Quite glabrous.

Nom. Jap. *Maruba-sumire*.

This species is not uncommon. It differs from *Viola Keiskei* Miq. (Id. Prol. Fl. Jap. p. 85; Maxim. in Mém. Biol. IX. p. 734.), principally by the habit of being estoloniferous. In Tokyo, it is commonly found.

Viola Keiskei Miq. is probably a form of *V. hirta* Linn.

Viola (Nomimium) **Tanakaeana** Makino, sp. nov.

Acaulescent; rhizome erect, inarticulated, white; main roots few, slender, with fine rootlets. Leaves long-petiolate, deltoid-lanceolate, attenuated above, acutish at the apex, auriculate with ovate lobes, with an open and deep sinus, depressed-crenate, membranaceous, equally pubescent with minute short white hairs above, glabrous beneath, 3-7 cm. long, $1\frac{1}{2}$ - $2\frac{1}{2}$ cm. wide after anthesis; petiole very slender, longer than the blade, wingless, glabrous, attaining $13\frac{1}{2}$ cm. in length after anthesis; stipules adnate below, pale, membranaceous, loosely ciliated, 3-6 mm. long, the free portion subulate and acuminate. Peduncles 1 to few, gracile, puberulent above, bracteate above the middle; bracts 2, subulato-linear, about 4 mm. long. Sepals lanceolate, acute, entire, viridescens, thin, pellucid towards the margin, 3-nerved; the basal auricles roundish, entire, glabrous. Capsule elliptical, glabrous, 5 mm. long, viridescens, mottled with purple.

Hab. Prov. SHINANO: Mt. Komagadale (*K. Tanaka!* Sept. 25, 1902).

Though the flowers are not yet seen, it is evidently a good new species, principally on account of its pubescent narrow leaves. The above new specific name was given, in honour of Mr. Kōichi Tanaka, who kindly sent me the specimens of this rare species.

Metaplexis japonica (Thunb.) Makino, nom. nov.

Pergularia japonica Thunb. Fl. Jap. (1784) p. 111; Willd. Sp. Pl. I. p. 1248; Pers. Syn. Pl. I. p. 271; Roem. et Schult. Syst. Veg. VI. p. 56; Spreng. Syst. Veg. I. p. 843.

Metaplexis Stauntoni R. Br.; Schult. Syst. Veg. VI. (1820) p. 111; Maxim. Prim. Fl. Amur. p. 196; Regel Tent. Fl. Ussur. no. 333; Franch. et Sav. Enum. Pl. Jap. I. p. 316; Franch. Pl. David. I. p. 207; Maxim. in Mém. Biol. IX. p. 810; Engl. et Maxim. in Engl. Bot. Jahrb. VI. p. 65; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 110; Diels in Engl. Bot. Jahrb. XXIX. p. 541; Palib. Conspect. Fl. Kor. II. p. 13.

Urostelma chinensis Bunge Enum. Pl. Chin. Bor. (1832) p. 44, no. 247.

Metaplexis chinensis Decne. in DC. Prodr. VIII. p. 511; Sieb. et Zucc. in Abhandl. Akad. Münch. IV. 3, p. 161; Miq. Prol. Fl. Jap. p. 58.

Metaplexis rostellata Turcz.; Walp. Ann. III. p. 49.

Nom. Jap. *Gaga-imo*.

Hab. Japan, widely distributed.

Lapsana humilis (Thunb.) Makino, nom. nov.

Prenanthes humilis Thunb. Fl. Jap. (1784) p. 302; Willd. Sp. Pl. III. p. 1544; Pers. Syn. Pl. II. p. 367; Spreng. Syst. Veg. III. p. 656.

Youngia? *humilis* DC. Prodr. VII. p. 194.

Lapsana parviflora A. Gray Bot. Jap. (1859) p. 396; Miq. Prol. Fl. Jap. p. 362; Franch. et Sav. Enum. Pl. Jap. I. p. 267; Maxim. in Mém. Biol. IX. p. 20, 347.

Nom. Jap. *Yabu-tabirako*.

Icon. Inuma's Somoku-Dzusesetsu, XV. fol. 31 no. 31.

Hab. Japan, common.

Crepis lanceolata (Houtt.) Schultz-Bip. in Zoll. Syst. Verz. Archip. Ind. p. 126, (nomen tantum), non Kit.

Prenanthes lanceolata Houtt. Nat. Hist. XXVIII. (1779) p. 383, tab. 66, fig. 2; Willd. Sp. Pl. III. p. 1535; Pers. Syn. Pl. II. p. 365; Spreng. Syst. Veg. III. p. 654.

Chondrilla lanceolata Poir. Encyc. Suppl. II. p. 329.

Youngia lanceolata DC. Prodr. VII. p. 193.

Prenanthes integra Thunb. Fl. Jap. (1784) p. 300; Hook. et Arn. Bot. Beech. Voy. p. 266.

Crepis integra Miq. Prol. Fl. Jap. p. 122; Franch. et Sav. Enum. Pl. Jap. I. p. 272; Maxim. in Mém. Biol. IX. p. 348; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 475.

Youngia integra A. Gray. Bot. Jap. p. 396.

Hieracoides integrum O. Kuntze Rev. Gen. Pl. I. p. 345.

Crepis tanegana Miq. Prol. Fl. Jap. p. 362.

Crepis nana Schultz-Bip. in Flora, (1852) p. 48, non Richards.

Nom. Jap. *Hosoba-wadan* (nov.).

Hab. Prov. HIGO: Tororo in Amakusa (*M. Murakami!* Nov. 1899); Prov. IWAMI: Nishikawauchi (*T. Saitō!* Sept. 4, 1901); Prov. SATSUMA: Akune (*T. Kawakami!* Oct. 1901); Prov. TSUSHIMA: Kutamichi (*K. Hirata!* Sept. 21, 1902).

var. β . pinnatiloba (Maxim.).

Crepis integra var. β . *pinnatiloba* Maxim. in Mém. Biol. IX. p. 350.

Nom. Jap. *Hama-naren, sotetsu-na*.

Hab. Japan.

var. γ . platyphylla (Franch. et Sav.).

Crepis integra β . *platyphylla* Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 272.

Leaves ample, the basal one attaining 23 cm. long, 11½ cm. broad.

Nom. Jap. *Wadan*.

Hab. Prov. AWA (Bōshū) : Amatsu (*S. Okubo!* herb. Sc. Coll. Imp. Univ. Tokyo, June 1882), Nabuto-zima (*T. Makino!* April 1896); Prov. IDZU : Okada in Isl. Ōshima (*S. Okubo!* herb. ibid. Apr. 1887); Prov. MUSASHI : Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino!* Nov. 20, 1890); Prov. SAGAMI : Misaki (*S. Matsuda!* herb. ibid. Dec. 29, 1893; *Y. Yabe!* herb. ibid. Nov. 10, 1900).

Lactuca laciniata (Houtt.) Makino, emend., non Roth.

Prenanthes laciniata Houtt. Nat. Hist. XXVIII. (1779) p. 381, tab. 66, fig. 1, (*forma laciniata*).

Prenanthes squarrosa Thunb. Fl. Jap. (1784) p. 303, (*forma laciniata*); Willd. Sp. Pl. III. p. 1542; Pers. Syn. Pl. II. p. 366; Spreng. Syst. Veg. III. p. 656; DC. Prodr. VII. p. 196.

Chondrilla squarrosa Poir. Encyc. Suppl. II. p. 332.

Lactuca squarrosa Miq. Prol. Fl. Jap. pp. 121, 362, (*forma laciniata*); Franch. et Sav. Enum. Pl. Jap. I. p. 268; Kanitz Anthoph. Jap. p. 19; Maxim. in Mém. Biol. IX. p. 353; Franch. Pl. David. I. p. 187; Korsh. in Act. Hort. Petrop. XII. p. 362; Palib. Consp. Fl. Kor. I. p. 124.

Lactuca squarrosa var. *laciniata* O. Kuntze Rev. Gen. Pl. I. p. 349.

Lactuca brevirostris Champ. in Hook. Kew Journ. Bot. IV. p. 237, (*forma indivisa*); Walp. Ann. V. p. 324; Benth. Fl. Hongk. p. 192; Clarke Comp. Ind. p. 265; Hook. fil. Fl. Brit. Ind. III. p. 405; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 479; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 55; Diels in Engl. Bot. Jahrb. XXIX. p. 613.

Lactuca bialata Griff. Notul. Pl. Asiat. IV. p. 247, (*forma indivisa*).

Lactuca amurensis Regel Ind. Sem. Hort. Petrop. (1857) p. 42, et Fl. Ussur. no. 305; Maxim. Prim. Fl. Amur. p. 178, et 473; Debeaux Fl. Tchef. p. 89.

Sonchus floridanus Lour. Fl. Cochinch. p. 480?; Bretschn. Early Res. p. 160.

Nom. Jap. *Aki-no-nogeshi* (*forma laciniata*); *hosoba-no-akinonogeshi* (*forma indivisa*).

Hab. Japan, common.

Lactuca chinensis (Thunb.) Makino, nom. nov.

Prenanthes chinensis Thunb. Fl. Jap. (1784) p. 301; Willd. Sp. Pl. III. p. 1533; Pers. Syn. Pl. II. p. 365; Spreng. Syst. Veg. III. p. 654.

Youngia? *chinensis* DC. Prodr. VII. p. 194.

Chondrilla chinensis Poir. Encyc. Suppl. II. p. 331.

Prenanthes versicolor Turcz. in litt. 1829, ex DC. Prodr. VII. p. 151; Fisch. in Bunge Enum. Pl. Chin. Bor. (1832) p. 40.

Lactuca versicolor Schultz-Bip. (1362); Herd. Pl. Radd. III. 4. p. 29; Maxim. in Mém. Biol. IX. p. 362; Franch. Pl. David. I. p. 188; Baker et S. Moore in Journ. Linn. Soc. XVII. p. 383; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 485; O. Kuntze Rev. Gen. Pl. I p. 349; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 56; Palib. Consp. Fl. Kor. I. p. 124; Diels in Engl. Bot. Jahrb. XXIX. p. 631.

Crepis versicolor Fisch. in litt. 1822, ex DC. Prodr. VII. p. 151.

Ixeris versicolor DC. Prodr. VII. p. 151; Ledeb. Fl. Ross. II. p. 817; Benth. Fl. Hongk. p. 193; Maxim. Prim. Fl. Amur. pp. 180, 473, 483; Miq. Prol. Fl. Jap. p. 123; Franch. et Sav. Enum. Pl. Jap. I. p. 269; Korsh. in Act. Hort. Petrop. XII. p. 363.

Barkhausia versicolor Spreng. Syst. Veg. III. p. 651.

Lagoseris versicolor Fisch.

Barkhausia tenella Benth. (1842); Walp. Rep. II. p. 697.

Nom. Jap. *Takasago-sō*.

Hab. Japan, widely distributed.

Lactuca (*Ixeris*) **tamagawaensis** Makino Notes on Jap. Pl. XV in Bot. Mag., Tokyo, VI. (1892) p. 56, (nomen).

Lactuca versicolor var. *arenicola* Makino Pl. Jap. Nov. v. Minus Cegn. in Bot. Mag., Tokyo, XII. (1898) p. 44.

Nom. Jap. *Kawara-nigana*.

Hab. Japan.

This species grows on dry gravelly beds of rivers, bearing yellow flowers and densely tufted angustate leaves.

Rubia cordifolia Linn. var. *γ. lancifolia* Regel Tent. Fl. Ussur. (1862) p. 81, tab. 8, fig. 3.

Leaves 8-4-verticillate, oblong to lanceolate, rounded to acute at the base, cuspidato-acute at the apex, petiolate, 5-3-plinerved.

Nom. Jap. *Kurumaba-akane*.

Hab. Prov. HIZEN in Kiusiu: Nishidomari near Nagasaki (Herb! T. Makino, without date), Nakagawa-gō in Nagasaki (*N. Okada!* Sept. 18, 1902).

This variety is occasionally found and new to the Flora of Japan. The floriferous specimen is due to the kindness of Mr. N. Okada.

Dicliptera japonica (Thunb.) Makino, nom. nov.

Dianthera japonica Thunb. Fl. Jap. (1784) p. 21, tab. 4.

Justicia crinita Vahl Symb. Bot. II. (1791) p. 16; Thunb. in Trans. Linn. Soc. II. (1793) p. 338; Willd. Sp. Pl. I. p. 97; Pers. Syn. Pl. I. p. 22, Spreng. Syst. Veg. I. p. 84; Rœm. et Schult. Syst. Veg. I. p. 143.

Dicliptera crinita Nees in DC. Prodr. XI. (1847) p. 485; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 248; Diels in Engl. Bot. Jahrb. XXIX. p. 579.

Dicliptera Buergeriana Miq. in Ann. Mus. Bot. Lugd.-Bot. II. p. 125, et Prol. Fl. Jap. p. 57; Franch. et Sav. Enum. Pl. Jap. I. p. 356; Franch. Pl. David. I. p. 230.

Nom. Jap. *Haguro-sō*.

Hab. Japan, widely spread.

Clerodendron japonicum (Thunb.)

Volkameria japonica Thunb. Fl. Jap. (1784) p. 255; Willd. Sp. Pl. III. p. 385; Pers. Syn. Pl. II. p. 145; DC. Prodr. XI. p. 656.

Volkameria Kœmpferi Jacq. Ic. Pl. Rar. III. (1793), tab. 500; Willd. Sp. Pl. III. p. 385; Pers. Syn. Pl. II. p. 145.

Clerodendron Kœmpferi Sieb. herb. ex Miquel, non Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Gen. XII. p. 51.

Clerodendron squamatum Vahl Symb. Bot. II. (1791) p. 74; Willd. Sp. Pl. III. p. 387; Pers. Syn. Pl. II. p. 145; Spreng. Syst. Veg. II. p. 759; Sieb. et Zucc. in Abh. Akad. Muench. IV. 3, p. 153; Schauer in DC. Prodr. XI. p. 669; Hook. et Arn. Bot. Beechey's Voy. p. 205; Miq. Prol. Fl. Jap. p. 31; Franch. et Sav. Enum. Pl. Jap. I. p. 359; Hance in Journ. Bot. (1879) p. 13; Clarke in Hook. fil. Fl. Brit. Ind. IV. p. 593; Bot. Reg. tab. 649; Maxim. in Mém. Biol. XII. p. 521; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 262; Diels in Engl. Bot. Jahrb. XXIX. p. 550.

Volkameria coccinea Herb. Amat. tab. 519.

Clerodendron coccineum Dietr. Synops. III. p. 613.

Tei Too, vulgo *Fi Giri* Kæmpf. Amœn. Exot. p. 861.

Nom. Jap. *Higiri*.

Icon. Banks Icon. Kæmpf. tab. 58.

Hab. Japan, cultivated.

Clerodendron Kæmpferi Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Gen. XII. (1830) p. 51, is *Sterculia platanifolia* Linn. fil. (Jap. *Ao-giri*.)

Vitex trifolia Linn. Cod. n. 4638; Schauer in DC. Prodr. XI. p. 683; Clarke in Hook. fil. Fl. Brit. Ind. IV. p. 583; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 258.

var. β . **ovata** (Thunb.) Makino.

Vitex ovata Thunb. Fl. Jap. (1784) p. 257; Willd. Sp. Pl. III. p. 390; Pers. Syn. Pl. II. p. 143; Spreng. Syst. Veg. II. p. 756; Hook. et Arn. Bot. Beech. Voy. pp. 206, 268, tab. 17; Sieb. et Zucc. in Abh. Akad. Muench. IV. 3, p. 152; Debeaux Fl. Tchef. p. 113.

Vitex Agnus-castus var. γ . *ovata* O. Kuntze Rev. Gen. Pl. II. p. 511.

Vitex rotundifolia Linn. fil.

Vitex repens Planco Fl. Filip. p. 513.

Vitex trifolia β . *unifoliolata* Schauer l. c.; Benth. Fl. Hongk. p. 273; Miq. Prol. Fl. Jap. p. 31; Franch. et Sav. Enum. Pl. Jap. I. p. 360; Maxim. in Mém. Biol. XII. p. 514; Engl. in Engl. Bot. Jahrb. VI. p. 66; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 71; Palib. Consp. Fl. Kor. II. p. 25.

Nom. Jap. *Hamagō*.

Hab. Japan.

Galium trachyspermum A. Gray, supra p. 40. = **Galium gracile** Bunge Enum. Pl. Chin. Bor. (1832) p. 35; Walp. Rep. II. p. 456; Maxim. Ind. Fl. Pek. in Prim. Fl. Amur. p. 472; Pretschn. Hist. Eur. Bot. Disc. in China, p. 334, non Wallr.

Galium gracile Maxim. in Mém. Biol. IX. p. 261, et XI. p. 802; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 394, ex parte.

Galium Bungei Steud.

Galium miltorrhizum Hance in Journ. Bot. (1868) p. 114; Debeaux Fl. Shangh. p. 34; Pretsch. l. c. p. 533.

Nom. Jap. *Yotsuba-mugura*.

ADD. *Hab.* Prov. MUSASHI: Tokyo (*S. Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, May 21, 1877), Wada-mura (Herb. *!* ibid. June 6, 1880); Prov. AWA (BŌSHŪ): Mt. Kiyosumi (*S. Ōkubo!* herb. ibid. June 12, 1882); Prov. IDZU: Omuro (*S. Ōkubo!* herb. ibid. June 4, 1883); Prov. KAGA: Mt. Hakusan (*R. Yatabe and J. Matsumura!* herb. ibid. Aug. 6, 1881); Prov. UZEN: Between Hondōzi and Shidzu (*R. Yatabe and S. Ōkubo!* herb. ibid. July 21, 1887); Prov. SŪO: Ōuchi-mura (*D. Nikai!* herb. ibid. May 19, 1895).

Galium tokyoense Makino, supra p. 39. = **Galium asprellum** Michx. Fl. Bor.-Amer. I. p. 78; Pers. Syn. Pl. I. p. 126; Roem. et Schult. Syst. Veg. III. p. 222; Spreng. Syst. Veg. I. p. 387; DC. Prodr. IV. p. 598; Torr. et Gray Fl. N. Amer. II. p. 23; Gray Syn. Fl. N. Amer. I. 2, p. 39, et Man. Bot. ed. 5, p. 209.

Galium pennsylvanicum Muhl.; Willd. ms. ex Roem. et Schult. Syst. Veg. Mant. III. p. 183.

Galium spinulosum Raf.

Galium micranthum Pursh Fl. Am. Sept. I. p. 103?

Galium dahuricum Turcz.; Ledeb. Fl. Ross. II. p. 409; Walp. Rep. VI. p. 17.

Galium davuricum a. fructu glabro Maxim. Prim. Fl. Amur. p. 140; Regel Tent. Fl. Ussur. p. 81; Herd. Pl. Radd. III. 1, p. 26, tab. III. fig. 4, c.

Galium asprellum β. davuricum Maxim. in Mém. Biol. IX. p. 262; Korsh. in Act. Hort. Petrop. XII. p. 347.

Nom. Jap. *Hana-mugura*.

ADD. *Hab.* Prov. KŌDZUKE: Near Ikaho (Herb. *!* Sc. Coll. Imp. Univ. Tokyo); Prov. NEMURO in Hokkaidō: Shibetsu (*K. Miyabe!* herb. ibid. July 12, 1884, sub nom. *Galium triflorum*).

Galium asprellum β. lasiocarpum Makino, supra p. 43. = **Galium pseudo-asprellum** Makino, sp. nov.

? *Galium asprellum a. typicum* Maxim. in Mém. Biol. IX. p. 262;

Franch. et Sav. Enum. Pl. Jap. I. p. 215; Franch. Pl. David. I. p. 156; Korsh. in Act. Hort. Petrop. XII. p. 347.

? *Galium asprellum* Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 393.

? *Galium davuricum* β . *fructu hispido* Maxim. Prim. Fl. Amur. p. 140; Regel Tent. Fl. Ussur. p. 82; Er. Schm. Reis. im Amur. u. Ins. Sachal. p. 48.

Perennial, attaining about $2\frac{1}{2}$ m. in length; roots dense. Stem weak, slender, usually leaning on bushes, branched, retrorsely aculeato-scabrous on the angles. Leaves 6-verticillate, but those of the branches often 4 or 5, patent, linear-lanceolate to linear-oblong, or angustato-oblong, cuspidato-acute to cuspidato-rounded-obtuse at the apex, acutely attenuated below, very shortly petiolate or sessile, retrorsely aculeato-muricate on the margin and midrib beneath, antorsely muricato-hispid above and on the midrib above, attaining 36 mm. long, 12 mm. broad; lateral veins loose. Peduncles axillary and terminal, numerous, 2-3 times tri-dichotomous, glabrous or retrorsely subaculeato-scabrous below; bracts or bracteoles opposite, linear or lato-linear, acuminate, usually shorter than the peduncles or pedicels; bracteoles often minute; pedicels capillary, longer than the flower, attaining about 12 mm. long; the peduncles and pedicels soon divaricate. Flowers small, loose, greenish, $1\frac{3}{4}$ -3 mm. across. Corolla 4-parted; lobes deltoid, minutely beaked at the apex. Stamens short. Style erect, bifid, about 1 mm. long; stigma capitate. Ovary uncinato-hispid. Fruit about $1\frac{1}{3}$ mm. long, uncinato-hispid (hook curved upwards), the mericarp elliptical-oblong. Fl. July-September.

Nom. Jap. *Ōba-no-yaemugura*.

Hab. Prov. MUSASHI: Mt. Yōkami (*T. Makino!* July 16, 1888), Asukayama (*R. Yatabe and J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, May 4, 1879), Tokyo (*R. Yatabe and J. Matsumura!* herb. ibid. July 13, 1879), Ōtsuka in Tokyo (*T. Makino!* Sept. 1886), Dōkwan-yama (*T. Makino!* Aug. 17, 1888); Prov. SHIMOOSA: Kōnodai (*T. Makino!* May 25, 1884) Prov. SHIMOISUKE: Nikkō. (*T. Makino!* July 30, 1884); Prov. SHINANO: Mt. Ushihitōge (*R. Yatabe and J. Matsumura!* herb. ibid. July. 19, 1880); Prov. MUTSU: Kanegasawa (*Herb.!* ibid. Aug. 16, 1884); Prov. Ugo: Kwan-onzi-mura (*I. Satō!* June 1892); Prov. TOSA: Mt. Yokogura (*T. Makino!* Aug. 28, 1887), Mt. Tebako (*T. Makino!* Aug. 1885); Prov. ISE: Yachi-mura (*Z. Umemura!* Aug. 24, 1894); Prov. SHIKUZEN: Kubara-mura in Kasuya-gōri (*K. Nagano!* herb. ibid. Oct. 25, 1891); Prov. ISHIKARI in Hokkaidō: Kamikawa (*K. Miyabe!* herb. ibid. Aug. 10, 1891).

Grows on mountains or hills. It apparently differs from *Galium asprellum* Michx., by the more diffuse and longer stem, the filiform peduncles, the looser inflorescence, the greenish flower, the uncinato-hispid fruit, the bifid style, and the opposite bracts. It resembles some form of *Galium triflorum* Michx.; its flower is perfectly similar to that of the latter, but the uncinata hairs on the fruit are characteristic.

Galium Niewerthi Franch. et Sav. Enum. Pl. Jap. II. (1879) p. 393; Maxim. in Mém. Biol. XI. p. 802.

Perennial, attaining about 8decim. long. Stem weak, slender, glabrous, few-branching at the base, often branched above. Leaves 5-4- or 6-verticillate, patent or erect-patent, elliptico-oblong to narrow-oblong, abruptly cuspidate or short-acuminate, acute at the base, subsessile, antrorsely sparsely muricato-hispid and hispid-ciliated, 1-nerved, attaining 26 mm. long, 9 mm. wide. Peduncles not long, terminal and lateral and forming together a loose terminal panicle, filiform, di-trichotomous; pedicels capillary, longer than the fruit; bracts acuminato-linear; bracteoles minute and setaceous. Flower small, greenish, 2mm. across. Corolla patent, 4-parted; lobes elliptical-ovate, beaked at the apex. Stamens short. Style shorter than the corolla, connate at the base. Fruit glabrous, 2½mm. long, the mericarp oblong.

Nom. Jap. *Yabu-mugura*.

Hab. Prov. MUSASHI: Shinagawa (*T. Makino!* June 25, 1886), Dōkwan-yama (*T. Makino!* Aug. 17, 1888, June 1896), Komaba (*T. Makino!* Aug. 12, 1891), Near Akabane (*T. Makino!* Sept. 1894).

Allied to *Galium pseudo-asprellum* Makino, but the stem is shorter and glabrous, the leaves are antrorsely muricato-hispid and usually fewer in number in whorls, and the fruit is quite glabrous. This is not uncommon in wooded hills near Tokyo.

Galium Aparine Linn. *forma leiocarpum* Makino, supra p. 43. =

Galium Aparine Linn. var. **spurium** Koch Syn. Fl. Germ. et Helv. ed. 3, p. 283; Ledeb. Fl. Ross. II. p. 420.

Galium spurium Linn. Cod. n. 865; DC. Prodr. IV. p. 608; Ledeb. Fl. Alt. I. p. 134.

Galium hispidum Roth.

Galium agreste β. *leiospermum* Wallr.

Gymnadenia Keiskei Maxim. var. **Kinoshitai** Makino, var. nov.

Perennial, attaining about 10 cm. high. Tuber solitary, perpendicular oblong-cylindrical, thick, about 13-14 mm. long, 3-4 mm. across; roots few, short; turio lateral, sessile. Stem slender, erect, terete, glabrous, quite green, monophyllous below and few-vaginate at the base. Leaves erect-patent, arcuate dorsally, broadly linear, acutish, concave above, cylindricovaginate at the base, entire, quite green, somewhat thickish, 3-nerved, $4\frac{1}{2}$ - $5\frac{1}{2}$ cm. long, $5-7\frac{1}{2}$ mm. broad. Raceme short, secundly 1-3-flowered; rachis short, attaining about 7 mm. long, green; bracts shorter than the ovary, subulate, acuminate, $2\frac{1}{2}$ -9 mm. long. Flowers 5-7 mm. across, white and shaded with very light violet, inodorous. Outer perianth erect-patent, concave, 3-nerved; the upper one elliptical-ovate, rounded-obtuse, about 3 mm. or a little more long; the lateral ones obliquely ovate, obtuse, slightly longer than the upper. Inner perianth connivent, scarcely shorter than or nearly equal to the outer-upper one in length, concave, ovato-oval, somewhat oblique, obtuse, 2-nerved, deeper in colour. Labellum 8-10 mm. long, 8-9 mm. wide, sessile, 3-parted, broadly cuneate at the base, with two short purple lines at the base above; the lateral lobes erect-patent, ligulato-oblong, obtuse; the midlobe a little longer than the lateral ones, ligulate, truncato-rounded and slightly bifid at the end. Calcar small, about 2 mm. long, horizontal, clavato-oblong, rounded at the end, usually scarcely curved. Anther erect, closely placed, purpurascens. Ovary pedicellate, cylindrical, curved in the apical portion, glabrous, green, 8-13 mm. long including the pedicel. Bulbiferous at the top of the raceme in autumn after anthesis.

Nom. Jap. *Koani-chidori* (T. Kinoshita).

Hab. Prov. MUSASHI: Tokyo, cult. from Koani Village in the prov. Ugo (*T. Makino!* June 3, 1903).

This differs from the type, by the form of the labellum, narrower leaves, colour of the flower, and the bulbiferous habit. It was first found and collected in the sphagnous place on the foot of some mountain in Missato in Koani Village, Kita-akita-gōri, prov. Ugo, June 28, 1902, by Dr. Tomosaburō Kinoshita, and my specimens are due to the kindness of the collector.

Ampelopsis japonica (Thunb.) Makino, nom. nov.

Paulinia japonica Thunb. Fl. Jap. (1784) p. 170; Willd. Sp. Pl. II.

p. 463; Pers. Syn. Pl. I. p. 443; Spreng. Syst. Veg. II. p. 250; DC. Prodr. I. p. 606.

Ampelopsis serjanacefolia Bunge Enum. Pl. Chin. Bor. (1832) p. 12; Regel in Gartenfl. (1867) p. 3, tab. 531; Planch. in DC. Monogr. Phanerog. V. p. 459; Diels in Engler's Bot. Jahrb. XXIX. p. 466; Pretsch. Hist. Eur. Bot. Disc. China, p. 330.

Cissus serjanicefolia Walp. Rep. Bot. Syst. I. p. 441.

Vitis serianacefolia Maxim. in Mém. Biol. IX. p. 149; Franch. et Sav. II. p. 316; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 136.

Vitis pentaphylla Miq. Prol. Fl. Jap. p. 90; Baker et S. Moore in Journ. Linn. Soc. XVII. p. 381, non Thunb.

Vitis pentaphylla var. β . *pinnatifida* Franch. et Sav. Enum. Pl. Jap I. p. 85.

Cissus viticifolia Sieb. et Zucc. *a.* et β . in Abhandl. Akad. Münch. IV. 2, p. 196.

Nom. Jap. *Kagami-gusa* (old name), *Byakuren*.

Hab. Japan, occasionally cultivated.

Formerly introduced from China.

Podocarpus Nagi (Thunb.) Zoll. et Moritzi.

Myrica Nagi Thunb. Fl. Jap. (1784) p. 76.

Nageia Nagi Kuntze Rev. Gen. Pl. II. p. 798.

Podocarpus Nageia R. Br. ex Mirbel in Mém. du Mus. Par. XIII. p. 75; Sieb. et Zucc. Fl. Jap. II. p. 71, tab. 135. et in Abhandlung. Akad. Muench. IV. 3, p. 233; Endl. Syn. Conif. (1847) p. 207; Zoll. Syst. Verz. Ind. Archip. p. 82; Parlat. in DC. Prodr. XVI. 2, p. 508; Maxim. in Mém. Biol. VII. p. 562; Miq. Prol. Fl. Jap. p. 332; Franch. et Sav. Enum. Pl. Jap. I. p. 474; Mast. in Journ. Linn. Soc. XVIII. p. 501; Veitch Man. Conif. (1881) p. 319; Eichl. in Engl. et Prantl Nat. Pfl.-Fam. II. 1, p. 104; Makino in Bot. Mag., Tokyo, XII. (1898) p. 257; Henry List Pl. Formos. p. 91.

Nageia japonica Gaertn. Fruct. et Sem. Pl. I. (1788) p. 191, tab. 39, fig. 8; Willd. Sp. Pl. IV. p. 749; Pers. Syn. Pl. II. p. 614; Spreng. Syst. Veg. I. p. 455; Gord. Pin. ed. 3, (1880) p. 188.

Dammara Veitchii Henk. et Hochst.

Agathis Dammara Engl. in Engl. Bot. Jahrb. IV. p. 353, non Rich.

Na, vulgo *Nagi*, item *Tsikura siba* Kämpf. Amœn. Exot. p. 773, cum ic. in p. 874.

Nom. Jap. *Nagi*, *chikara-shiba*.

Hab. Japan, wild, but mainly cultivated.

forma variegata (Gord.)

Nageia japonica variegata Gord. Pin. ed. 3, p. 189.

Hab. Japan, cultivated.

var. β . ovata (Henk. et Hochst.)

Podocarpus ovata Henk. et Hochst.; Parlat. in DC. Prodr. XVI. 2, p. 509.

Nageia ovata Gord. Pin. ed. 3, (1880) p. 191.

Podocarpus Nageia β . rotundifolia Maxim. in Regel Gartenfl. (1864) p. 37, et in Mém. Biol. VII. p. 562; Franch. et Sav. Enum. Pl. Jap. I. p. 474; Mast. in Journ. Linn. Soc. XVIII. p. 501.

Hab. Japan, cultivated.

forma variegata (Gord.)

Nageia ovata variegata Gord. Pin. ed. 3, p. 191.

Podocarpus ovata β . variegata Parlat. in DC. Prodr. XVI. 2, p. 509.

Hab. Japan, cultivated.

var. γ . angustifolia (Maxim.)

Podocarpus Nageia γ . angustifolia Maxim. in Regel Gartenfl. p. 37, et in Mém. Biol. VII. p. 562; Franch. et Sav. Enum. Pl. Jap. I. p. 475; Mast. in Journ. Linn. Soc. XVIII. p. 501.

Hab. Japan, cultivated.

var. δ . caesia (Maxim.)

Podocarpus caesia Maxim. in Mém. Biol. VII. p. 562; Franch. et Sav. Enum. Pl. Jap. I. p. 474; Mast. in Journ. Linn. Soc. XVIII. p. 501; Bretschn. Hist. Europ. Bot. Disc. China pp. 600, 610.

Nageia caesia O. Kuntze Rev. Gen. Pl. II. p. 800.

Podocarpus Nageia var. caesia Makino in Bot. Mag., Tokyo, XIII. p. 268.

Nom. Jap. *Usuyuki-nagi* (T. Makino).

Hab. Japan, cultivated.

Polygonatum lasianthum Maxim. **forma amabile** (Yatabe)

Polygonatum amabile Yatabe in Bot. Mag., Tokyo, VI. p. 279, tab. 8, et Iconogr. Fl. Jap. I. p. 234, tab. 57.

Hab. Prov. HITACHI: Mt. Tsukuba (T. Makino!).

There exists all the gradation between the type and this form.

Thalictrum Watanabei Yatabe in Bot. Mag., Tokyo, VI. p. 307, tab. 9 = **Thalictrum tuberiferum** Maxim. in Mém. Biol. IX. p. 607; Trautv. in Act. Hort. Petrop. VIII. fasc. 1, p. 31; Franch. et Sav. Enum. Pl. Jap. II. p. 264; Lecoy. Monogr. Thalict. p. 86, tab. 3, fig. 12.

Hav. Prov. TOSA: Mt. Tebako (*T. Makino!* Aug. 1885).

This is a form in the depauperated state of *Th. tuberiferum* Maxim.

Polygonum (*Persicaria*) **viscoferum** Makino, sp. nov.

Annual, attaining 4-14 decim. in height. Stem erect, ligneous and usually branched at the base (the branches ascending-erect), nodose, terete, antrorsely depressed pilose but glabrous above, attaining about 4mm. across at the very base, the internodes usually shorter than the leaves. Leaves very shortly petioled, lato-lanceolate to angustato-lanceolate, acuminate at the apex, rounded or obtuse or acute at the base, 2-10cm. long, 4-29mm. wide, membranaceous, more or less firm, antrorsely pilose on both surfaces, antrorsely sculeato-ciliated on the margin; lateral veins many, erect-patent, arcuate upwards; petiole pilose; sheath longer than the petiole, about 5-13mm. long, truncate, antrorsely adpressed pilose, long-ciliated with erect hairs. Inflorescence loosely ramoso with filiform branches, the internodes of the rachis and branches glabrous and glutinous towards the top. Spikes slender, angustate, $1\frac{1}{2}$ - $7\frac{1}{2}$ cm. long, about 4mm. across, rather densely flowered, but often interruptedly flowered below; bracts oval, thinly pilose, long-ciliated, green but scarious on the margin. Flowers 3-7-fasciculate, shortly pedicellate, 2mm. long; pedicel very slightly longer than the bracts. Perianth 4-5-fid, pale; segments oval or oval-elliptical, rounded-obtuse, concave. Stamens 7-8, included; filament subulato-filiform. Ovary ellipsoid; styles 3, connate below, shorter than the ovary. Akene completely enclosed in the perianth, ellipsoid, acutely pointed at the top, trigonous with obtuse angles, castaneous-black, smooth, shining, $1\frac{1}{4}$ mm. long, the face concave in centre.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1884, July 14, 1889), Kamo (*T. Makino!* Sept. 21, 1887), Mitani (*T. Makino!* Oct. 6, 1892), Mt. Kuromori (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 3, 1888); Prov. KII: Mt. Shiomi-tōge (*J. Matsumura and S. Okubo!* herb. ibid. July 24, 1883); Prov. SAGAMI: Ubago in Hakone (*S. Okubo!* herb. ibid. Aug. 18, 1883); Prov. MUSASHI: Okusawa (*T. Makino!* Aug. 14, 1900), Shibuya-mura (*T. Makino!* Aug. 4, 1900), Near Nakano (*T. Makino!* Sept. 22, 1896), Near Arai (*T. Makino!* Sept. 22, 1896); Prov. SHIMOOSA:

Kōnodai (*T. Makino!* Sept. 1894), Shimoshidzu (*T. Makino!* Sept. 10, 1895).

var. β . robustum Makino.

More robust and taller. Stem glabrous, or slightly pilose towards the top of the internodes. Leaves angustato-lanceolate, narrowly acuminate, minutely pilose above, pilose on the midrib and veins beneath, aculeato-ciliated, attaining 14 cm. long, $2\frac{1}{4}$ cm. wide; petiole very short, sheath attaining $1\frac{3}{4}$ cm. in length. Spike attaining about 9 mm. long. Flowers smaller, $1\frac{2}{3}$ cm. long. Akene smaller, $1\frac{1}{2}$ mm. long.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1884), Kamo (*T. Makino!* Sept. 21, 1887); Prov. MIKAWA: Nakagaito in Higashi-kamo-gōri (*G. Nagura!* Sept. 17, 1897); Prov. IWASHIRO: Aidzu (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 23, 1879), Foot of Mt. Bandai (*J. Matsumura!* herb. *ibid.* Aug. 17, 1879); Prov. IWAKI: Mimikai in Fukuura-mura (*T. Makino!* Aug. 16, 1890); Prov. SŪō: Kano-mura in Tsuno-gōri (*D. Nikai!* herb. *ibid.* Aug. 13, 1896); Prov. HIDAHA: Horomui (*Y. Tokubuchi!* herb. *ibid.* Aug. 19, 1892), Horoidzumi (*Y. Tokubuchi!* Aug. 17, 1892).

***Polygonum* (Echinocaulon) breviochreatum Makino, sp. nov.**

Polygonum muricatum Maxim. in litt. non Meisn.

Annual, attaining 6 decim. long. Stem slender, weak, erect from the decumbent or often radicant base, branched at the base; the internodes longer or shorter than the leaves, smooth but retrorsely loosely pilose on the opposite side to the leaves above. Leaves distant, patent, shortly petioled, oblong-lanceolate or lanceolate, acuminate, subsagittato-truncate or subcordate at the base, thinly pilose above, glabrous but loosely antrorsely pilose on the midrib beneath, antrorsely minutely scabro-ciliated on the margin, membranaceous, attaining about 8 cm. long, 2 cm. broad; lateral veins subnumerous, delicate, erect-patent, arcuate; petiole glabrous, 3–15 mm. long; sheath shorter than or equal to the petiole, ciliated, adpressed-hirsute externally. Peduncles terminal or axillary, loosely placed, slender, filiform, patently glanduloso-hispid; bracts subulate, acute, entire, thinly pilose, about 2 mm. long. Spike short, laxly often interruptedly few-flowered. Flower very shortly pedicellate, 4 mm. long, pale-rose; pedicel usually shorter than the bracteoles; bracteoles elliptical, acutish, scarious on both edges, laxly glanduloso-hispid on the carina above. Perianth 5-cleft; segments elliptical, obtuse. Stamens 7, included; filaments unequal in length. Ovary

ovoid; styles 3, very short, scarcely connate at the very base; stigma capitate. Akene enclosed in the perianth, ovoid-globose, with an acute triangular short tip, smooth, shining, fulvo-castaneous, with persistent styles, $2\frac{1}{2}$ mm. across.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1884), Idzuma (*T. Makino!* Oct. 17, 1892); Prov. YAMATO: Nara (*K. Tsuzi!* Oct. 1902).

This differs from *Polygonum muricatum* Meisn., by the narrow leaves and the ovoid-globose akene.

***Polygonum* (Echinocaulon) *auriculatum* Makino, sp. nov. non Meisn.**

Annual, bay-ferruginous when dried. Stem long and slender, decumbent and often radicant below, flaccid, ramose, sparsely or sparingly retrorsely strigoso-pilose on the surface; internodes shorter than the leaves. Leaves very shortly petioled, the upper ones nearly sessile, linear-lanceolate, or linear, but oblong-lanceolate in the basal ones, attenuated above and with an obtuse or acutish tip, auriculato-hastate or subcordate at the base, flaccid-membranaceous, 2-11 cm. long, $\frac{2}{3}$ -2 cm. wide, glabrous, but antrorsely minutely ciliated on the margin, and the midrib very thinly antrorsely pilose above and retrorsely so below beneath; lateral veins not conspicuous, many, patulous; the basal auricles divaricate or subdivaricate, falcately ovato-lanceolate or oblong, usually obtuse, attaining 13 mm. in length; petiole subglabrous, attaining 7 mm. long; sheath long, attaining $1\frac{3}{4}$ cm. long, glabrous, not ciliated, with a retrorsely piloso-strigose ring at the base. Peduncle lateral, patent, usually longer than the leaves, divaricately 2-3-branched above, sometimes compound and provided with leafy bracts; the branches filiform, thinly glanduloso-hispid, attaining about 6 cm. long; bracts vaginate, short, obliquely truncate, glabrous, but often piloso-ciliated or loosely ciliolate. Flowers 2-6-fasciculate, shortly pedicellate, 3 mm. long, rose; pedicel longer or shorter than the bracteoles, very laxly glanduloso-pilose above; bracteoles pellucid-membranaceous, connate below, entire, glabrous, longer than the bracts. Perianth 4-cleft; segments oval-elliptical, rounded-obtuse at the apex. Stamens 4-6, included. Ovary ovoid; styles 3, connate excepting the upper portion, nearly as long as the ovary. Akene completely enclosed in the persistent perianth and shorter than them, $1\frac{2}{3}$ mm. across, subtrigonous-globose, minutely beaked with a short base of the styles, minutely ruguloso-reticulated, nigro-castaneous.

Hab. Prov. TOSA: Eno-mura in Hata-gōri (*T. Makino!* Aug. 5, 1889), Ryū-mura (*T. Makino!* Oct. 16, 1892; *S. Yano!* 1892), Asakura (*T.*

Makino! Sept. 1892, Oct. 15, 1892), Erasawa (*I. Doi*! Aug. 15, 1890), Iwado (*I. Doi*! Aug. 28, 1890); Prov. IYO: Shōyenzimura in Ousen-gōri (*K. Okudaira*! July 1894); Prov. MIKAWA: Near Toyohashi (*T. Makino*! Oct. 25, 1893, Oct. 29, 1894), Kameyama in Atsumi-gōri (*T. Makino*! Oct. 27, 1893), Noba in Hadzu-gōri (*G. Nagura*! Sept. 5, 1897); Prov. KADZUSA: Nakahara-mura in Nagara-gōri (Herb.! Sc. Coll. Imp. Univ. Tokyo, Sept. 1880); Prov. HYŪGA: Takanahe (*R. Yatabe and J. Matsumura*! herb. ibid. July 27, 1882); Prov. MINO: Iwato-mura (Herb.! ibid.); Prov. SUŌ: Ōuchi-mura (*D. Nikai*! herb. ibid. July 10, 1892); LOOSHOO: Mizato-magiri in Isl. Okinawa (Herb.! ibid. May 1887), Isl. Kume-shima (*H. Kuroiwa*!); FORMOSA: Daihoku (*T. Makino*! herb. ibid. Nov. 10, 1896).

This species differs from *Polygonum muricatum* Meisn., by its angustate leaves, the lateral peduncle, and the black-castaneous ruguloso-reticulated akene, and the latter has the acutely angled pale smooth shining and usually exserted akene.

***Polygonum* (Echinocaulon) *hastato-sagittatum* Makino, sp. nov.**

Annual, attaining 14 decim. in height. Stem slender and long, erect or ascending from the decumbent rooting base, erect-patently loosely ramose, smooth or retrorsely muricate, the internodes shorter than the leaves but the superior ones longer than them. Leaves petiolate, lanceolate, acuminate, oblong-lanceolate and acutish in the lower ones, subhastato-sagittate or subhastato-truncate or auriculato-cordate at the base, but the superior ones often obtuse at the base, 1½–12cm. long, ⅓–3⅓cm. wide, glabrous but minutely pilose towards the apex above, very minutely retrorsely or antrorsely scabro-muricate on the margin, scabrous on the midrib beneath, membranaceous; lateral veins numerous, erect-patent, delicate; petiole angustate, attaining ⅓–3¼cm. in length, retrorsely muricate or glabrous; sheath usually longer than the petiole, cylindrical, membranaceous, attaining 3½cm. long, glabrous, shortly ciliated, with a retrorsely muricated or strigose ring at the base. Panicle loose; branches slender; peduncles angustate or filiform, longer or much so than the spike, glanduloso-hispid above or sometimes throughout. Spike capitate to ellipsoid, 6–13mm. long, densely many-flowered; bracts lato-ovate, glabrous, ciliated, thinly membranaceous. Flowers pedicellate, 3–4½mm. long, rose-coloured; pedicels 2-fasciculate, one exserted and other not, glanduloso-hispid above. Perianth 5-cleft; segments elliptical, rounded at the apex. Stamens included, 7; filament filiform. Ovary narrowly ovoid; styles 3, erect or erect-patent, as long

as the ovary, connate at the basal portion; stigma capitate. Akene enclosed in the perianth and shorter than them, ovoid, acute at the apex, acutely triquetrous, nigro-castaneous, smooth, shining, $2\frac{1}{2}$ -3mm. long, the face ovate.

Hab. Prov. TOSA: Kōchi (*T. Makino!* Nov. 1891, Oct. 1892), Asakura (*T. Makino!* Sept. 23, 1892), Edagawa (*T. Makino!* Oct. 22, 1892); Prov. SHIMOOSA: Mama (*T. Makino!* Oct. 26, 1890, Oct. 6, 1895); Prov. KADZUSA: Haseya (Herb. ! Sc. Coll. Imp. Univ. Tokyo, Sept. 1880); Prov. SHIMOTSUKE: Nikko (Herb. ! *ibid.*); HOKKAIDŌ (*L. Boehmer!* herb. *ibid.*); FORMOSA: Daihoku (*T. Makino!* herb. *ibid.* Nov. 12, 1896; *C. Ōwatari!* herb. *ibid.* Dec. 21, 1897).

This seems to be allied to *Polygonum muricatum* Meisn. and *P. strigosum* R. Br., but it differs from the former, by the narrow leaves and the densely many-flowered capitate spike; from the latter, chiefly by the shining acute-triquetrous akene. It is widely distributed over Japan.

var. β . latifolium Makino.

Polygonum muricatum var. Maxim. in litt.

Usually shorter, attaining 11 decim. in length. Stem ascending and diffuse from the decumbent radican base, loosely ramose. Leaves ovate to elliptical, or elliptical-oblong, abruptly short-acuminate, truncate or subcordate at the base, very minutely antrorsely scabro-ciliated on the margin, $1\frac{1}{2}$ -7cm. long, $\frac{4}{5}$ - $3\frac{1}{2}$ cm. broad, the lower ones often reflexed; petiole 2-18mm. long. Panicle loose; peduncle filiform, longer than the spike. Spike capitate to ellipsoid, 5-13mm. long, densely many-flowered; bracts ovato-subulate, glabrous or thinly glanduloso-hispid, ciliated, membranaceous. Flowers pedicellate, $2\frac{1}{2}$ -3mm. long, rose-purple above and pale or pale-viridescent below; pedicels 2-fasciculate, one shortly exerted and other not, slightly glanduloso-hispid above. Perianth 5-cleft; segments elliptical or elliptico-oval, rounded-obtuse at the apex. Stamens 7-9. Ovary ovoid; styles shorter than the ovary, connate half below or at the basal portion. Akene enclosed in the perianth, ovoid, acute, acutely triquetrous, umber, smooth, shining, $2\frac{1}{2}$ mm. long, the face ovate.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1884), Arioka in Hata-gōri (*T. Makino!* Nov. 4, 1885), Koishiki near Kōchi (*S. Yano!* Sept. 1888), Godaisan (*T. Makino!* Sept. 29, 1892), Kambara (*T. Makino!* Oct. 17, 1892), Edagawa (*T. Makino!* Oct. 22, 1892); Prov. SAGAMI: Hakone (*T. Makino!* Sept. 24, 1886); Prov. MUSASHI: Near Ōmiya-hachiman (*R. Yatabe and J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Oct. 5, 1879), Kawasaki (*T. Makino!*); Prov. SUŌ: Ōuchi-mura (*D. Nikai!*

herb. *ibid.* Oct 4, 1891); Prov. TSUSHIMA: Kuta (*K. Hirata!* Oct. 17, 1902).

Closely allied to *Polygonum muricatum* Meisn., but my plant has the spike capitate and densely many-flowered, and the akene entirely wrapped in the perianth.

Platanthera (Bifoliæ) **Takedai** Makino, sp. nov.

About 17–22cm. in height, glabrous. Tuber perpendicular, radiform, thicker towards the base and elongate towards the end; roots few; turio one, sessile. Stem erect, angulate, with 2 membranaceous cataphylls at the base. Leaves 2, remotely placed; the lower one normal, placed in the middle of the whole plant, ovato-oblong to narrowly oblong, obtuse, amplexicaul and not sheathing at the base, $3\frac{1}{2}$ –7cm. long, $1\frac{2}{3}$ –2cm. or more wide, with 3 main nerves; the upper one bract-like, ovato-linear to linear-lanceolate, acuminate, sessile, green. Raceme 3–6cm. long, loosely 8–10-flowered; rachis angulate, green; bracts subulato-linear, acuminate, green, the inferior ones longer than the flowers and the superior ones shorter than them. Flower viridescent, inodorous, about 9mm. in vertical diameter. Outer perianth: the upper one erect, lato-ovate, obtuse, 4mm. long, 3mm. broad, 3–2-nerved; lateral ones turned downwards, lato-linear, obtuse, longer than the upper one, 5mm. long, 2-nerved. Inner perianth erect, nearly as long as the outer-upper perianth, obliquely narrow-deltoid-ovate, acute, pale-viridescent, 1-nerved. Labellum simple, pendulous, slightly longer than the outer-lateral perianth, deltoid-linear, gradually attenuated above, obtuse at the end, thickish, green, 6mm. long; calcar extremely short, small, shortly conical, green, 1mm. long. Gynostemium broad, deeply emarginate at the apex; anther-cells obliquely and distantly placed, pale; gland small, discoid, yellow; pollinia clavate, stipitate, pale; rostellum very short, broad. Ovary cylindrico-oblong, about 6mm. long.

Hab. SHIMOTSUKE: Mt. Nyohō in Nikkō (*H. Takeda!* July 20, 1902, July 1903).

This is closely allied to *Platanthera ophrydioides* Fr. Schm., but the calcar is very different; or a variety of it?

Sedum hakonense Makino in Bot. Mag., Tokyo, XV. (1901) p. 35.

ADD. Stems nigro-purpurascens. Leaves semiterete, green, very minutely nigro-purpurascens-punctate in the lower ones, 1-sulcate in centre

on the upper surface. Sepals greenish. Petals yellow internally, viridescent externally, not white! Stamens yellow; anther yellow-purpurascens. Ovary viridescent-yellow. Flowers July.

I have a living specimen before me, by the kindness of Viscount Y. Matsudaira, who collected it on Mt. Amagi in the province of Idzu, where it was found growing on the large trees.

MIYOSHIA Makino gen. nov. (Pl. V.)

Perianth perigynous, 2-seriate, persistent; tube 0; lobes short, imbricated, erect-patent or patulous, the sepals smaller. Stamens 6, 2-seriate, equal, all perfect, the oppositisepalous 3 free, the oppositipetalous 3 shortly adnate to the base of petals at the base; filament subulate; anther 2-celled, rounded-ovate, introrse, dehiscing longitudinally, basifixed; pollen yellow, oblong. Ovary semi-inferior, 3-locular, the loculament opposite to the sepals, the superior free portion entirely separated into 3 parts, each short-conical, opposite to the sepals; style short; stigma terminal, simple; ovules many in each loculament, pluri-seriate along the elongated placenta, sessile, anatropous. Capsule semi-inferior, accompanied by the persistent perianth, dehiscing loculicidally through the ventral suture of the superior free portion. Seeds minute, many, sessile, ferruginous, with the transparent thinly membranaceous loose outer coat; the inner coat longitudinally striate, adherent to the nucellus; endosperm copious; embryo very minute.

Saprophytic small aphyllous quite glabrous terrestrial perennial, destitute of chlorophyll. Rhizome hypogæous, shortly elongate, ascending, squamigerous, with fibrous roots. Scape gracile, slender, simple, provided with membranaceous sparse scales. Inflorescence terminal, more or less paniculated raceme; bract small; bracteoles often with the minute unexpanded flower-bud. Flowers regular, hermaphrodite, small, pedicellate, laxly disposed, quite glabrous; pedicel arising from the axil of bracts.

This genus seems to be nearly related to *Aletris* of *Liliaceæ*, but the saprophytic, entirely glabrous, leafless, non-chlorophyll habit; ovary which is separated in the superior free portion; and perianth destitute of the free tube, are the principal characters to separate this plant from that genus; it is perhaps better to establish for it a new family, *Miyoshiaceæ*, having affinities to *Liliaceæ*, *Bromeliaceæ*, *Hemodoraceæ*, and *Amaryllidaceæ*.

I have proposed to dedicate this genus to Dr. Manabu Miyoshi, Professor of Botany in the Science College, Imperial University of Tokyo.

Miyoshia Sakurairi Makino sp. nov.

Plant 8–19cm. high, yellowish-pale. Rhizome clothed with membranaceous scales, provided with 1 to few scapes; roots ramose, without root-hairs. Scapes erect, 1–3 (or more?), terete, loosely scaly; scales small, adpressed, pellucid, embracing, entire, 1-nerved, attaining 5mm. in length, the superior ones subulato-lanceolate and acuminate, the lower ones ovato-subulate and obtuse, the basal ones shorter and usually imbricated. Subpaniculated raceme narrow, 2–6½cm. long, 3–15-flowered; rachis gracile, erect, flexuous; bracts usually shorter than the pedicel but sometimes scarcely longer than it, deltoid-subulate, acuminate, hyalino-membranaceous, entire, 1-nerved, 1–3½mm. long; bracteoles usually 1–2, smaller than the bracts. Flowers 3½–5mm. across; pedicels erect-patent, strict, continued to the flower, slightly shorter to scarcely longer than the flower, 1½–3½mm. long, the inferior ones often 2-branched. Perianth entire, smooth, 1-nerved; the outer 3 much smaller, deltoid, obtuse, 1mm. or less long; the inner 3 2mm. long, ovato-deltoid, obtuse or subobtuse or submucronato-obtuse at the apex. Stamens perigynous, shorter than the inner perianth, about 1½mm. long; filament stout, linear-subulate, as long as two-thirds of the inner perianth, thickish, 1-nerved, the inner ones slightly adherent dorsally to the perianth at the base; anther minute, didymous, auriculate at the base. Ovary: the inferior portion subtrigono-short-obconical, slightly shorter than the inner perianth, thick-walled, the superior free 3-separated portions erect and short-conical; styles erect or slightly declined outwards, slightly lower than the inner perianth; stigma depressed-subcapitate; ovules minute, obovato-oblong, the superior ones slightly ascending, the middle ones horizontal, and the inferior ones slightly descending. Capsule 3mm. long and across, the superior free portions globose-ovoid, inflated, divaricato-patulous, shortly beaked with the persistent style, carpel membranaceo-coriaceous. Seeds obovato-oblong, ⅔mm. long; nucellus obovately oblong-fusiform; the inner coat about 9–11-striate. Flowers July-August.

Nom. Jap. *Sakurai-sō* (nov.).

Hab. Prov. MINO: Foot of Mt. Ena (*H. Sakurai!* July 27, 1903).

This grows in the shady forest in middle Japan, having the habit of the aphyllous *Burmanna*, and undoubtedly it is a rarest species. I have named this species in honour of Mr. Hanzaburō Sakurai, a botanist in the Imperial Household Museum of Tokyo, who discovered and collected it and generously sent me specimens of this most interesting species.

Explanation of Pl. V. — *Fig. 1*, Whole plant, with a dried fruiting scape of last year; *figs. 2, 3*, Do., destitute of rhizomes; *fig. 4*, Fruiting subpaniculated raceme of last year; *fig. 5*, Scale and a portion of the scape;

fig. 6, Scale laid open; *fig. 7*, Basal scale laid open; *fig. 8*, Transverse section of the scape; *fig. 9*, Transverse section of the rachis of the inflorescence; *fig. 10*, Transverse section of the pedicel; *fig. 11*, bract; *figs. 12, 13*, bracteoles; *fig. 14*, Flower, with the pedicel, bract, bracteole, and a portion of the rachis; *fig. 15*, Flower seen from top; *fig. 16*, Vertical section of the flower; *fig. 17*, One of sepals (*a*), and the petal accompanied by a stamen; *fig. 18*, Stamen, inner face; *fig. 19*, Do., dorsal face; *fig. 20*, Pollen, *a* seen from end; *fig. 21*, Superior free separated portion of the ovary; *fig. 22*, Transverse section of the inferior portion of the ovary; *fig. 23*, Ovule; *fig. 24*, Floral diagram; *fig. 25*, Dehiscent capsule; *fig. 26*, Seed:—*all except 1–4 magnified.*

Selaginella (Homœophyllum, Cyliandrostachyæ) **selaginoides** (Linn.) Link; A Gray Man. Bot. ed. 5, p. 675; Benth. Handb. Brit. Fl. ed. 5, p. 547; Hieron. in Engl. et Prantl Nat. Pflanzenfam. I. 4, p. 669, fig. 401; Chirst in Bull. Herb. Boiss. IV. (1896) p. 675.

Lycopodium selaginoides Linn. Sp. Pl. p. 1101; Richt. Cod. n. 7965; Sw. Syn. Fil. p. 181; Hoffm. Deutsch. Fl. II. p. 16; Willd. Sp. Pl. V. p. 28; Schk. Krypt. Gew. tab. 165; Michx. Fl. Bor. Amer. II. p. 284; Spreng. Syst. Veg. IV. p. 16; Hook. Fl. Bor.-Amer. II. p. 267; Lamk. et DC. Fl. Fr. ed. 3, II. p. 574; Ait. Hort. Kew. ed. 2, II. p. 494; Reichb. Fl. Germ. Excurs. p. 153; Nyman Syl. Fl. Eur. p. 436; Hook. Brit. Ferns tab. 52.

Lycopodiodes selaginodes O. Kuntze Rev. Gen. Pl. II. p. 824.

Selaginella spinosa Beauv.; Spring Monogr. Lycop. II. p. 59; Ledeb. Fl. Ross. IV. p. 501; Kunze in Linnæa XXIII. p. 293; Baker Fern All. p. 34.

Selaginella spinulosa A. Braun; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 728; Milde Fil. Eur. et Atl. As. Min. et Sib. p. 260.

Lycopodium ciliatum Lam.

Selaginella ciliata Opiz.

Hab. Prov. RIKUCHŪ: Mt. Hayachine (*G. Toba!* Aug. 8, 1903).

Rare in Japan. My best thanks are due to Mr. Genzō Toba, who sent me specimens of it.

Spergularia salina Presl; Maxim. Fl. Tangut. n. 168, et Enum. Pl. Mongol. n. 262.

Lepigonum salinum Kindb.

Lepigonum leiospermum Kindb.

Spergularia media Pers. Syn. Pl. I. p. 504, *a. heterosperma* Fenzl in Ledeb. Fl. Ross. II. p. 168; Maxim. Ind. Pekin. in Prim. Fl. Amur. p. 472, et in Mém. Biol. IX. p. 54; Franch. Pl. David. I. p. 54; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 71.

Hab. Prov. KITAMI in Hokkaidō: Isl. Rishiri (*T. Makino!* Aug. 1903).

New to the Flora of Japan. It grows among littoral rocks of the island.

Polygonum (*Persicaria*) **Hydropiper** Linn. Sp. Pl. p. 361; Willd. Sp. Pl. II. p. 444, et Enum. Pl. Hort. Berol. p. 428; Pers. Syn. Pl. I. p. 440; Spreng. Syst. Veg. II. p. 258; Meisn. Monogr. Polygon. p. 76, et in DC. Prodr. XIV. p. 109; Engl. Bot. tab. 989; Ait. Hort. Kew. ed. 2, II. p. 418; Reichb. Fl. Germ. Excurs. p. 571; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 535; Ledeb. Fl. Alt. II. p. 84, et Fl. Ross. III. p. 523; Hook. Fl. Bor-Amer. II. p. 132; Fr. Schm. in Maxim. Prim. Fl. Amur. p. 230, et Reis. im Amur. u. Ins. Sachal. p. 59; Regel Tent. Fl. Ussur. n. 416; Hance in Ann. Sc. Nat. 5 Ser. V. p. 240; Benth. Fl. Hongk. p. 288, et Handb. Brit. Fl. ed. 5, p. 387; A. Gray Man. Bot. ed. 5, p. 416; Franch. et Sav. Euum. Pl. Jap. I. p. 396; Franch. Pl. David. I. p. 254; Hook. fil. Fl. Brit. Ind. V. p. 39; Herd. in Act. Hort. Petrop. XI. p. 224; Korsh. in Act. Hort. Petrop. XII. p. 382; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 341; O. Kuntze Rev. Gen. Pl. II. p. 599; Henry List Pl. Formos. p. 76; Palib. Consp. Fl. Kor. II. p. 34; Diels in Engler's Bot. Jahrb. XXIX. p. 312.

a. vulgare Meisn. in DC. Prodr. XIV. p. 109, et in Miq. Ann. Mus. Bot. Lugd.-Bat. II. p. 58.

Hab. Japan, common.

Sometimes this has the subaquatic habit in Japan.

forma purpurascens Makino.

Leaves purpurascens, other as in the type.

Hab. Prov. SAGAMI: Hakone, side of Lake Ashi (*T. Makino!* Sept. 24, 1886); Prov. TOSA: Sakawa, cult. (*T. Makino!* Oct. 1, 1887).

β. lætevirens Makino in Bot. Mag., Tokyo, X. (1896) p. 64.

Polygonum flaccidum var. *lætevirens* Makino l.c. VI. (1892) pp. 49, 129.

Annual, robust, attaining 1m. or more in height. Stem stout, ramose, glabrous, with turgid nodes. Leaves flaccid, shortly petiolate, ovato-lanceolate or oblong-lanceolate, shortly acuminate, obtuse to rounded-

obtuse or subacute at the base, membranaceous, glabrous, but scabro-hispidulous on the midrib and ciliated on the margins, quite green; very minutely pellucid-punctate under lens, attaining 12cm. long, 5cm. wide; lateral veins many, erect-patent, arcuate; petiole usually winged above by the decurrence from the blade; sheath usually longer than the petiole, membranaceous, glabrous below, disparsedly adpressed-hirsute above, setosociliated, attaining 1½cm. in length. Spikes terminal and axillary, nutant, rather densely flowered, but interruptedly flowered and leafy at the below; rachis filiform; bracts short, vaginate, truncate, slightly ciliated. Flowers 3-7-fasciculate, pedicellate, 3mm. long and across, greenish-white. Perianth 4-cleft, campanulate, pellucid-punctate; segments oval or oval-elliptical, rounded at the apex. Stamens 6, included. Pistil slightly lower than the stamens in height; ovary ovoid-oval; styles 2 sometimes 3, connate below, erect-patent, slightly shorter than the ovary; stigma capitate. Akene enclosed in the persistent perianth, rounded-ovoid, biconvex, mixed with trigonous ones, nigro-castaneous, minutely ruguloso-granulated, 2mm. long and broad.

Hab. Prov. TOSA: Sakawa, cult. (*T. Makino!* Oct. 1, 1887), Ōsato, cult. (*T. Yoshinaga!* Nov. 1891); Prov. UZEN: Hishitsu in Nishitagawagōri, cult. (*T. Nagasawa!* Sept. 19, 1893); Prov. MUSASHI: Tokyo, cult. (*T. Makino!* Sept. 1896).

This is cultivated for the acrid leaves which are used as a condiment, and is never found in the wild state. It is much larger than the type and entirely green.

γ. **Maximowiczii** (Regel).

Polygonum Maximowiczii Regel Gartenfl. (1865) p. 99, tab. 468; Franch. et Sav. Enum. Pl. Jap. I. p. 396.

Polygonum gramineum Meisn. in Miq. Ann. Mus. Bot. Lugd.-Bat. II. p. 59; Miq. Prol. Fl. Jap. p. 299.

Ovary ovoid, compressed; styles 2, connate at the base, as long as the ovary; stigma capitate.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!*); Prov. SHIMOTSUKE: Kiyotaki in Nikkō, cult. (*T. Makino!* Sept. 4, 1903).

Only cultivated for the acrid leaves.

δ. **fastigiatum** Makino. var. nov.

Annual, erect, fastigiately much branching, densely leaved, attaining 5 decim. in height. Stems slender, terete, glabrous, nodose; nodes turged and glabrous; internodes short, shorter than the leaves. Leaves lanceolate or narrowly lanceolate, acuminate, attenuated below into the petiole, mem-

branceous, minutely pellucid-punctate under lens, glabrous, but often antrorsely minutely spinuloso-ciliated on the margin and often adpressed-scarbro-hirsute on the midrib beneath, attaining about 5cm. long, 1cm. broad; midrib slender; veins many, delicate, erect-patent; petiole gracile, glabrous, attaining about 8mm. long; sheath short, usually slightly shorter than the petiole, attaining 8mm. long, glabrous, but setoso-ciliated, thinly membranaceous, loosely nerved. Spike angustate, erect or more or less nutant, laxly flowered, but interruptedly flowered and leafy at the base; rachis filiform; bracts short, vaginate, truncate, loosely ciliated, membranaceous above, $1\frac{1}{2}$ -2mm. long. Flowers 2-5-fasciculate, pedicellate, small, $1\frac{1}{2}$ -2mm. long, white then often rosy, greenish below; pedicel shorter than the flowers. Perianth campanulate, 4-5-cleft, pellucid-punctate; segments oblong, obtuse. Stamens 6, included; anther white. Pistil slightly lower than the stamens; ovary elliptical, compressed; styles 2, connate below, scarcely shorter than the ovary; stigma capitate. Akene enclosed in the persistent viridescent perianth, subovato-elliptical, biconvex, nigro-castaneous, very minutely rugulose, $1\frac{1}{2}$ mm. long.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* 1888, 1903); Prov. KADZUSA: Ichinomiya (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 1880); Prov. MUTSU: Hirosaki (*T. Iwakawa!* herb. ibid. Aug. 19, 1880); Prov. UZEN: Tsurugaoka (*T. Nagasawa!* Aug. 27, 1893).

Cultivated for the acrid leaves. It differs from the type by the fastigiately much ramose and densely leaved habit, the leaves and flowers are also smaller, and the akene smaller and narrower.

forma angustissimum.

Small. Leaves angustato-linear or linear-filiform.

Hab. Prov. MUSASHI: Tokyo, cult. (*S. Furukawa!* Oct. 1903).

Only cultivated.

Polygonum (Echinocaulon) **sagittatum** Linn. *a.* **sibiricum** Meisn. in DC. Prodr. XIV. p. 132; Herd. in Act. Hort. Petrop. XI. p. 254.

Polygonum sagittatum Linn. Sp. Pl. p. 363, Cod. n. 2871; Thunb. Fl. Jap. p. 167, ex parte.

Polygonum sagittatum a. boreale Meisn. Monogr. Polygon. p. 65; Ledeb. Fl. Ross. III. p. 529.

Polygonum sagittatum var. aestivum Makino in Bot. Mag., Tokyo, VI. (1892) p. 49.

Polygonum foliis sagittatis, caule aculeato Gmel. Fl. Sib. III. p. 65, tab. 13, fig. 2.

Polygonum Sieboldii A. Gray in Parry's Exped. Jap. II. p. 317.

Stem often geniculato-divaricato-ramose and often shortly decumbent at the base; branches slender, erect, loosely ramose, retrorsely aculeate on the angles. Leaves petiolate, sagittato-oblong-lanceolate, or sagittato-lanceolate, smooth-margined, retrorsely aculeate at the base of the midrib beneath; petiole often retrorsely aculeate. Flowers capitate. Akene trigonous. Flowers May-June, but sometimes August on mountains.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1885, 1891), Tokano (*T. Makino!* June 10, 11, 1889, June 1893), Doi in Aki (*T. Makino!* June 3, 1892); Prov. IYO: Kuwabara (*K. Okudaira!* June 7, 1897); Prov. BUZEN: Mt. Iwadake (*R. Yatabe and J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 17, 1882); Prov. MŪSASHI: Ōmiya in Wada-mura (*T. Makino!* June 3, 1888, May 15, 1901), Near Fuchū (*T. Makino!* May 27, 1894), Setagaya (*T. Makino!* May 6, 1894), Shimoshakushii (*T. Makino!* May 20, 1900), Onden (*T. Makino!* June 1900); Prov. IDZU: Yugashima (*S. Ōkubo!* herb. ibid. June 14, 1883); Prov. SŪŌ: Ōuchi-mura (*D. Nikai!* herb. ibid. June 5, 1892); Prov. SHIMOTSUKE: Nikkō (*R. Yatabe!* herb. ibid. Aug. 1, 1877; *T. Makino!* 1900, Aug. 1903).

Widely distributed over this country.

β. americanum Meisn. in DC. Prodr. XIV. p. 132; Herd. in Act. Hort. Petrop. XI. p. 255.

Polygonum sagittatum Linn. Sp. Pl. p. 363, Cod. n. 2871, ex parte.

Polygonum sagittatum a. boreale Meisn. Monogr. Polygon. p. 65; Ledeb. Fl. Ross. III. p. 529, ex parte.

Polygonum sagittatum β. boreale Hook. Fl. Bor.-Amer. II. p. 131.

Polygonum sagittatum Ait. Hort. Kew. ed. 2, II. p. 420; A. Gray Man. Bot. et. 5, p. 418; O. Kuntze Rev. Gen. Pl. II. p. 559.

forma Sieboldi (Meisn.) Makino.

Polygonum Sieboldii Meisn. in DC. Prodr. XIV. p. 133, et in Miq. Ann. Mus. Bot. Lugd.-Bat. II. p. 63; Miq. Prol. Fl. Jap. p. 300; Franch. et Sav. Enum. Pl. Jap. I. p. 400; Maxim. in Mém. Biol. IX. p. 617.

Polygonum sagittatum var. Sieboldii Maxim. in litt.

Polygonum sagittatum Thunb. Fl. Jap. p. 167, ex parte.

Polygonum sagittatum (L.) Sieb. in Herb. Lugd.-Bat. ex Meisn.

Polygonum sagittatum Franch. et Sav. Enum. Pl. Jap. II. p. 476.

Similar to the American plant in size and form, but the leaves quite lgbrous on the margin. Flowers in autumn.

Herb. Prov. TOSA: Sakawa (*T. Makino!* 1884), Kōchi (*T. Makino!* Nov. 1891), Godaisan (*T. Makino!* Sept. 29, 1892), Warabioka (*T. Makino!* Nov. 6, 1885); Prov. HIGO: Haziudo in Amakusa (*M. Murakami!* Oct. 1899); Prov. MUSASHI: Ōmiya in Wada-mura (*R. Yatabe and J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 6, 1879), Near Shirako (*S. Ōkubo!* herb. ibid. Sept. 28, 1882), Dōkwan-yama (*S. Ōkubo!* herb. ibid. Aug. 15, 1878); Prov. SHIMOOSA: Mama (*T. Makino!* Oct. 6, 1895); Prov. SHIMOTSUKE: Kegon in Nikkō (*Herb.!* ibid. Oct. 5, 1879); Prov. TŌTŌMI: Tomioka-mura (*M. Hisamatsu!* herb. ibid. Sept. 1895).

This form is much stouter and more diffuse than *a. sibiricum* Meisn., and the flowers appear in autumn, while *a. sibiricum* Meisn. flowers in summer.

Anaphalis alpicola Makino, sp. nov.

Slaxly caespitose perennial, 14–20cm. high. Rhizome short, or shortly elongated, ascending, brownish-nigrescent. Stems erect, simple, foliate throughout, rather thinly albo-lanate. Leaves erect, laxly disposed, lanceolate or angustato-lanceolate sometimes linear-lanceolate, acuminate, sessile with the shortly attenuated base and narrowly alato-decurrent, the lower ones often shorter or sometimes longer and spathulato-ob lanceolate obtuse or acutish at the apex and narrowly attenuated below, rather thinly albo-lanate on both surfaces, 3–6cm. long, $\frac{1}{2}$ –1 $\frac{1}{3}$ cm. broad, herbaceo-membranaceous, 3-nerved, but the lateral nerves delicate and invisible superficially. Corymb exinvolucrate, compactly polycephalous or subpolycephalous, about 2–3 $\frac{1}{2}$ cm. across; peduncles few, short, albo-lanate. Heads subglobose, discoid, about 6mm. across. Involucral-bracts imbricated, pluri-seriate, scarious; the outer ones shorter, elliptical or oblong-elliptical, obtuse, pale-fulvous, more or less araneose below externally; the inner ones narrowly oblong to linear-oblong, obtuse or acutish, very slightly araneose below externally, white, but at first often purpureo-rose, pale-fulvous below, attaining 6 $\frac{1}{2}$ mm. long. Male florets numerous; the corolla-tube narrow, about 4mm. long, 5-fid; the lobes deltoid, acute; anther slightly exerted; style exerted, the arms erect; pappus rather numerous, a little longer than the corolla-tube, white, setæ somewhat incrassate towards the apex and clavellate and denticulate, not connate at the base. Female florets..... Flowers August.

Herb. Prov. HIDAOKA in Hokkaidō: Mt. Fuyushima in Shamani (*T. Kawakami!* Sept. 1900); Prov. SHINANO: Mt. Shirouma (*M. Orii!* Aug. 29,

1902; *B. Ioki!* Aug. 1903), Mt. Yarigadake near Mt. Shirouma (*K. Tanaka!* Aug. 1903).

This alpine species has an affinity to *Anaphalis pterocaulon* (Franch. et Sav.) Maxim.

Gymnadenia Keiskei Maxim. in Bull. Soc. Nat. Mosc. (1879) p. 61,
var. angustifolia (Finet).

Gymnadenia gracilis var. *angustifolia* Finet in Bull. Soc. Bot. Fr. (1900) p. 280.

Gymnadenia Keiskei var. *Kinoshitai* Makino in Bot. Mag., Tokyo, XVII. (1903) p. 113.

Bulblets about 1-5-aggregate at the top of the fruiting raceme or between the leaves at the top of sterile individuals, small, 3-6mm. long; root oblong, smooth, viridi-flavescent; bud terminal, short, pale, with very short sheaths.

Athyrium Fauriei (Christ) Makino.

Nephrodium Fauriei Christ in Bull. Herb. Boiss. IV. (1896) p. 671.

Athyrium nikkoense Makino in Bot. Mag., Tokyo, XVII. (1903) p. 43.

Hab. Northern (*U. Faurie!*) and Middle (*T. Makino!*) Japan.

Though sori are short and resemble those of *Nephrodium*, this species should properly be referred to *Athyrium*, coming near *A. yokoscence* (Franch. et Sav.) Christ, having a simpler and much smaller frond.

Arabis (*Sisymbriina?*) **Tanakana** Makino, sp. nov.

Small perennial, 3-6cm. high in flower. Caudex ramose, branches gracile, ascending, with a tuft of radical leaves at the top. Stem erect, simple, gracile, thinly pubescent with white stellate hairs, with 2-3 leaves. Radical leaves densely caespitose (the tuft 1-1½cm. across), subspathulato-linear, obtuse or acutish, gradually narrowed below, entire, rather thinly covered with white stellate hairs on both surfaces and margins, 5-10mm. long, 1-2mm. broad; veins parallel to the midrib below; cauline leaves remote, sessile, semiamplexicaul, oblong-lanceolate to oblong-ovate, obtuse or acutish at the apex, obtuse at the base, entire, 3-8mm. long, 1½-3mm. broad. Raceme short, laxly 3-10-flowered; rachis nearly glabrous. Flower white, 4mm.

across, pedicellate; pedicel erect-patent, glabrous, shorter than the flower. Sepals elliptico-oblong, obtuse, concave, 3-nerved, thin, thinly pilosulate on the back above, $1\frac{2}{3}$ mm. long. Petals elliptical, retuso-emarginate, cuneately attenuated to a claw, subflabellately loosely nerved, $2\frac{2}{3}$ mm. long. Stamens a little longer than the sepals; filament filiform, glabrous; anther ovato-oval. Pistil about $2\frac{1}{2}$ mm. long; ovary sessile, linear; style very short; stigma capitate. Siliqua (immature) linear, compressed, patent, glabrous, 11 mm. long, 1 mm. broad, with a patent pedicel about 3 mm. in length; valves 1-nerved and loosely veined. Seeds (immature) sub-2-seriate, oblong, wingless; funicle filiform; cotyledon accumbent.

Hab. Prov. SHINANO: Mt. Yarigadake near Mt. Shirouma (*K. Tanaka!* Aug. 1903).

Ranunculus (Hecatonía) **sulphureus** Soland. var. **altaicus** Trautv.; Maxim. Enum. Pl. Mongol. n. 34.

Ranunculus altaicus Laxm. (1774); Ledeb. Fl. Alt. II. p. 325, et Fl. Ross. I. p. 37.

Ranunculus altaicus a. typicus Regel et Schmalh. in Act. Hort. Petrop. V. p. 222.

Ranunculus frigidus Willd. Sp. Pl. II. (1799) p. 1312; Pers. Syn. Pl. II. p. 103; DC. Prodr. I. p. 35; Spreng. Syst. Veg. II. p. 651; Regel Pl. Radd. I. p. 49, non Schrank.

Ranunculus sulphureus DC. Syst. Nat. I. p. 274, non Soland.

Sepals fusco-pubescent. Petals broad and subobcordate.

Hab. Prov. SHINANO: Mt. Yarigadake near Mt. Shirouma (*K. Tanaka!* Aug. 1903).

New to the Flora of Japan. The Japanese form has the glabrous gynophore.

Ranunculus (Hecatonía) **pygmæus** Wahlenb. (1812); DC. Syst. Nat. I. p. 273, et Prodr. I. p. 35; Spreng. Syst. Veg. II. p. 651; Chamisso in Linnæa VI. p. 578; Hook. Fl. Bor.-Am. I. p. 17; Hook. et Arn. Bot. Beech. Voy. p. 121; Ledeb. Fl. Ross. I. p. 36; Torr. et Gray Fl. N. Am. I. p. 20; Gray Syn. Fl. N. Am. I. 1, p. 29; Britt. et Br. Ill. Fl. N. U. S. et Can. II. p. 76, fig. 1605.

Ranunculus Sabinii R. Br.; Hook. loc. cit. p. 17; Torr. et Gray loc. cit.

Perennial, 2-3 cm. high, 1-flowered. Rhizome erect or ascending, shortly elongated; roots fibrous and proportionally long. Stem erect, simple, thinly pubescent. Radical leaves few, long-petiolate, glabrous, reniform or subreniform, 4-8 mm. long, 7-11 mm. broad, broadly truncate or cordate at the base, 3-cleft with 3-lobed lateral segments, the middle segment obovato-elliptical and entire or shortly cuneato-obovate and 3-lobulate, the lobes of the lateral segments shortly oval-ovate; cauline leaves 2 or sometimes 1, remote, the inferior one petiolate, 3-cleft, the lateral segments usually 2- or sub-2-lobed, the superior one very shortly petiolate, usually 3-parted into oblong or angulato-oblong lacinae. Peduncle pubescent with subadpressed pale hairs. Flower about $7\frac{1}{2}$ mm. across, yellow. Sepals elliptical, thinly pilose, about 3 mm. long. Petals longer than the sepals, oblong, 4 mm. long. Stamens shorter than the sepals. Ovaries in the elliptical head.

Hab. Prov. SHINANO: Mt. Yarigadake near Mt. Shirouma (*K. Tanaka!* Aug. 1903).

New to the Japanese Flora. The radical leaves resemble those of some form of *Hydrocotyle rotundifolia* Roxb.

Zygadenus (*Anticlea*) **japonicus** Makino, sp. nov.

Perennial, 12-24 cm. in height. Bulb tunicate, ovoid, elongated into a neck above, 6-10 mm. across; the outer coat membranaceous, nigrescent, sub-fibrose above; roots fibrous, white. Leaves light green, not glaucous; radical ones 3, shorter than the stem, recurved-erect-patent, linear or broadly linear, gradually narrowed below, subacute or obtuse, keeled, 8-19 cm. long, 4-10 mm. broad; the nerves close. Stem 1, erect, strict, often provided with a reduced bract-like leaf in the middle or above it, and with a basal leaf which is shorter than the radical leaves. Raceme simple or often with 1 or 2 branches below, erect, shorter than the stem, laxly flowered, $2\frac{1}{2}$ -12 cm. long, $1\frac{1}{2}$ -3 cm. wide; rachis strict or subflexuous, light green; bracts subulato-lanceolate to orbiculato-ovate, acuminate or subacute, embracing the pedicel and longer or shorter than it, viridescent tinged with purple colour, sometimes slightly scarious on the margin, 3-25 mm. long. Flowers 8-12 mm. across, hermaphrodite, but those of the top of the raceme and all of those of branches male, pale-yellowish, viridescent and often tinged with purple externally; pedicel erect-patent, strict, light green shaded with purple, 2-15 mm. long. Perianth patulose or erect-patent, suberect after anthesis 7-8 mm. long, the base obconical and adnate to the ovary; segment

elliptical to oblong in the outer ones, subrhombico-ovate or narrowly subrhombico-ovate and attenuated into a broad unguis below in the inner ones, obtuse, subdiaphano-margined, adnate with a large emarginato-obcordate viridescent-yellow gland above the base internally, $2\frac{1}{2}$ –4mm. broad, about 7-nerved, the inner ones hardly longer than the outer. Stamens shorter than the perianth and $\frac{5}{7}$ the length of them; filaments dilated to the deltoid form towards the base; anther ovato-orbicular, cordate at the base, purplish; pollen yellow. Ovary conical, attenuated towards the style above, adherent to the perianth-base at the base, 3-locular, about 11–19-ovuled in each loculament; styles 3, a little lower than the perianth, uncinato-recurvo-patulous, slenderly attenuated towards the stigma terminal oblique simple and subpapillose. Capsule (immature) conical, tapering towards the persistent styles, the inferior portion obovato-obconical.

Hab. Prov. KITAMI in Hokkaidō: Summit of Mt. Rishiri in Isl. Rishiri (*T. Kawakami!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1899; *T. Makino!* Aug. 1903).

This species resembles *Zygadenus elegans* Pursh (= *Z. glaucus* Nutt.) of the North-America, but the flower is smaller, the leaves are narrower and not glaucous, the stem is lower, and the pedicel is shorter. The bracts closely resemble those of *Helonias glaberrima* Sims Bot. Mag. tab. 1680, which is referred to *Zygadenus Fremonti* Torr. in Index Kewensis, and to *Anticlea glauca* Kunth (= *Z. glaucus* Nutt.) by Kunth in his Enum. Pl. IV. p. 192. It apparently differs from *Zygadenus sibiricus* (Linn.) Gray, an Asiatic species. This genus is new to the Flora of Japan.

Papaver nudicaule Linn. Sp. Pl. p. 507; Richt. Cod. n. 3842; Willd. Sp. Pl. II. p. 1145; Poir. Encycl. V. p. 112; Pers. Syn. Pl. II. p. 62; Ait. Hort. Kew. ed. 2, III. p. 289; Bot. Mag. tab. 1633; Spreng. Syst. Veg. II. p. 569; DC. Syst. Nat. II. p. 70, et Prodr. I. p. 117; Chamisso et Schlecht. in Linnæa I. p. 551; Ledeb. Fl. Alt. II. p. 270; Bunge Enum. Pl. Chin. Bor. n. 22; Hook. Fl. Bor.-Amer. I. p. 34; Hook. et Arn. Bot. Beech. Voy. p. 121; Torr. et Gray Fl. N. Amer. I. p. 60; Hook. fil. et Thom. Fl. Ind. p. 249, et in Hook. fil. Fl. Brit. Ind. I. p. 117; Diels in Engler's Bot. Jahrb. XXIX. p. 354.

Papaver alpinum var. *nudicaule* Fisch. et Mey.; Ledeb. Fl. Ross. I. p. 87; Regel et Til. Fl. Ajan. p. 42; Regel Pl. Radd. I. p. 130; Maxim. Enum. Pl. Mongol. I. p. 35.

Densely caespitose (the tuft attaining 20cm. across); root elongated;

caudex densely covered with vaginate bases of old petioles. Leaves ovate or oblong-ovate in outline, sparsely hirsute, pinnatifid; segments oblong to cuneato-ovate in outline, entire or 2-4-inciso-cleft, the lobes oblong and acutish; petiole long, villosa-hirsute with ascending pale hairs above, the lower portion dilated and ciliated. Scapes radical, erect, green, hirsute with antrorsely subadpressed hairs, 7-15 cm. long. Flower about 3 cm. across. Sepals oval, viridescens, covered with dull brown hairs, about 1 cm. long. Petals subcuneato-orbiculate, virescent-flavescent. Stamens scarcely exceeding the ovary; filament viridescens; anther yellow. Ovary green, hispid with adpressed white hairs; stigmas 5-8, flavo-virid. Capsule ovoid-globose, obovoid, or elliptical-globose, hispid with antrorsely adpressed hairs, 7-11 mm. long, 6-10 mm. in diameter

Nom. Jap. *Chishima-hinageshi*.

Hab. Prov. KITAMI in Hokkaidō: Mt. Rishiri in Isl. Rishiri (*T. Kawakami!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1899; *T. Makino!* Aug. 12, 1903).

Our species probably belongs to *Papaver nudicaule* var. *arcticum* Elkan; A. Gray Syn. Fl. N. Amer. I, p. 89.

Rhododendron (Rhodorastrum) **dauricum** Linn.

a. dauricum Maxim. Rhod. As. Orient. p. 44.

Rhododendron dauricum Linn. Sp. Pl. p. 392; Richt. Cod. n. 3088; Pall. Fl. Ross. I, p. 47, tab. 32; Willd. Sp. Pl. II. p. 604; Pers. Syn. Pl. I. p. 478; Spreng. Syst. Veg. II. p. 292; Ait. Hort. Kew. ed. 2, III. p. 49; Bot. Mag. tab. 636, et 1888 (*v. sempervirens*); DC. Prodr. VII. p. 725; Chamisso et Schlecht. in Linnaea I. p. 512; Ledeb. Fl. Alt. II. p. 96, et Fl. Ross. II. p. 921; Maxim. Prim. Fl. Amur. p. 189 (pro parte); Regel Tent. Fl. Ussur. n. 322 (pro parte); Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 55; Herd. Pl. Radd. IV. p. 65; Korsch. in Act. Hort. Petrop. XII. p. 366; Boissieu in Bull. Herb. Boiss. V. p. 920.

Azalea daurica O. Kuntze Rev. Gen. Pl. II. p. 387.

Nom. Jap. *Ezo-murasakitsutsuzi* (K. Miyabe).

Hab. Hokkaidō (*L. Boehmer!* herb. Sc. Coll. Imp. Univ. Tokyo); Prov. HIDAKA: Horomambetsu (*Y. Tokubuchi!* Aug. 21, 1891); Prov. ISHIKARI: Sapporo, Bot. Gard. Agric. Coll., cult. (*K. Miyabe!* May 17, 1892).

β. mucronulatum (Turcz.) Maxim. Rhod. As. Orient. p. 44, et in Bull. Soc. Nat. Mosc. (1879) p. 29; Franch. et Sav. Enum. Pl. Jap. I.

p. 293; Hance in Journ. Bot. (1875) p. 133; Herd. Pl. Radd. IV. p. 66; Franch. Pl. David. I. p. 197; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 22; Palib. Consp. Fl. Kor. II. p. 3.

Rhododendron mucronulatum Turcz. (1837); DC. Prodr. VII. p. 727; Walp. Ann. II. p. 1120; Maxim. Ind. Fl. Pek. in Prim. Fl. Amur. p. 474; Bretschn. Hist. Eur. Bot. Disc. in Chin. pp. 350, 1056; Sargent Gard. a. Forest IX. (1896) p. 64, fig. 7.

Rhododendron davuricum Maxim. Prim. Fl. Amur. p. 189; Regel Tent. Fl. Ussur. n. 322, pro parte.

Nom. Jap. *Genkai-tsutsuzi* (nov.).

Hab. Prov. TSUSHIMA: Summit of Mt. Oyama-dake (*K. Hirata!* May 5, 1903).

RYNCHOSPORA Vahl. (Pl. VII.)

Rynchospora fusca (Linn.) Reem. et Schult. is not yet found in Japan; the plant referred to that species by Miquel in his "Prolusio Floræ Japonicæ" p. 77, is evidently a different species, which should be properly referred to *R. Fujiiana* Makino, or *R. japonica* Makino, mentioned below.

ANALYTICAL KEY TO THE JAPANESE SPECIES.

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|---|---|--|--|
| 1 | { | Style slightly bifid or undivided.....2 | |
| | | Style deeply bifid.....3 | |
| 2 | { | Spiculae in a terminal globose head; setae shorter than
the achene; rostrum very short; achene 2 mm. long
incl. the rostrum; leaves 2 mm. wide..... | <i>R. rubra</i> Makino. |
| | | Spiculae in a large panicle; setae longer than the achene;
rostrum longer than the achene; achene 10 mm. long
incl. the rostrum; leaves 11 mm. wide..... | <i>R. corymbosa</i> Britton. |
| 3 | { | Setae smooth.....4 | |
| | | Setae scabrous.....5 | |
| 4 | { | Achene oblong-obovate; spiculae 1-14-fasciculate..... | <i>R. Fujiiana</i> Makino. |
| | | Achene broadly obovate; spiculae 1-3-fasciculate..... | <i>R. Miyakawana</i> Makino. |
| 5 | { | Setae antorsely scabrous.....6 | |
| | | Setae retrorsely scabrous.....9 | |
| 6 | { | Setae exceeding the rostrum; spiculae 7 mm. long..... | <i>R. japonica</i> Makino. |
| | | Setae lower than the rostrum; spiculae not exceeding 6 mm.
in length.....7 | |
| 7 | { | Achene oblong-obovate; spiculae 5-6 mm. long..... | <i>R. Fujiiana</i> var. <i>scabriseta</i>
Makino. |
| | | Achene oval-obovate; spiculae not exceeding 4½ mm. long....8 | |

- 8 { Spiculae $4\frac{1}{2}$ mm. long; rostrum broadly conical; corymbs
in the superior part of the culm.....*R. glauca* Vahl.
- 9 { Spiculae 3- $3\frac{1}{2}$ mm. long; rostrum angustate-conical; corymbs
scattered throughout the culm.....*R. Umemurae* Makino.
- 10 { Setae 6.....10
Setae 9-14.....13
Setae much exceeding the rostrum, attaining 9 mm. long;
spiculae 8-10 mm. long.....*R. Fauriae* Franch.
- 11 { Setae lower than the rostrum; spiculae not exceeding 6 mm.
long.....11
Achene narrowly oblong.....*R. Yasudana* Makino.
- 12 { Achene orbiculato-obovoid or broadly obovoid.....12
Achene 2 mm. long; corymbs in the superior part of the
culm.....*R. Miyakeana* Makino.
- 13 { Achene $1\frac{1}{2}$ mm. long; corymbs scattered throughout the
culm.....*R. Hattoriani* Makino.
Setae 11-14; terminal corymb subcompound, attaining $1\frac{1}{2}$ cm.
across.....*R. alba* Vahl.
- 13 { Setae 9-11; terminal corymb compound, attaining $2\frac{1}{2}$ cm.
across, the radii about 2-5.....*R. alba* var. *kiusiana*
Makino.

Rynchospora (Haplostyleae) **rubra** (Lour.) Makino, nom. nov.

Schœnus ruber Lour. Fl. Cochinch. ed. Willd. (1793) p. 52; Poir. Enc. Meth. Suppl. II. p. 242; Spreng.

Syst. Veg. I (1825) p. 189; Steud. Syn. Pl. Glum. Cyper. (1855) p. 166.

Rynchospora Henkei Presl (1830); Kunth Enum. Pl. II. (1837) p. 290; Miq. Fl. Ind. Bat. III. p. 336; Steud. l. c. p. 148.

Haplostylis Meyenii Nees in Linnæa IX. (1834) p. 295.

Morisia Wallichii Nees (1834).

Sphaeroschœnus Wallichii Nees (1843).

Rynchospora Wallichiana Kunth l. c. p. 289; Zoll. Syst. Verz. Ind. Archip. I. (1854) p. 61; Miq. Fl. Ind. Bat. III. p. 335, Prol. Fl. Jap. pp. 77, 357, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 119; Steud. l. c. p. 148; Bœck. in Linnæa XXXVII. p. 542, excl. exampl. Amer.; F. Muell. Fragm. Phyt. Austral. IX. p. 17, et Sec. Syst. Cens. Austral. Pl. p. 214; Benth. Fl. Hongk. p. 396, et Fl. Austral. VII. p. 349; Franch. et Sav. Enum. Pl. Jap. II. p. 121; Kanitz Anthoph. Jap. p. 8; Bœck. in Engl. Bot. Jahrb. VI. p. 51; Clarke in Hook. fil. Fl. Brit. Ind. VI. p. 668, et in Journ. Linn. Soc. XXXIV. p. 88; Pears. in Journ. Linn. Soc. XXXIV. p. 358.

Cephaloschœnus parvus Nees in Linnæa IX. (1834) p. 296.

Rynchospora parva Kunth l. c. p. 302.

Morisia capitata Nees in Linnæa IX. p. 295.

Mariscus umbellatus var. *procerior* Zoll. l. c. p. 63.

Scirpus retusus Koenig.

(Pl. VII. fig. 1, a. b.)

Cæspitose, estoloniferous, attaining 65 cm. in height; rhizome very short, fasciculately rooting. Culm erect, slender, smooth, finely striate, foliate at the base. Leaves several, green, not rigid, very narrowly linear, shorter than the culm, attaining 2 mm. broad, glabrous, minutely scabrous on margins above, trigonous towards the acute apex, the interior ones long-vaginate. Corymbs forming a terminal globose head, 15–17 mm. in diameter; involucrel-bracts several, longer than the head, patent or more or less reflexed, unequal, leafy, subulato-linear, scabrous-margined, ciliated and dilated at the base, the longest one about 6 cm. Spiculae numerous, dense, subulato-lanceolate, compressed, 8 mm. long, testaceo-ferruginous, shining, with a female flower below and 1–3 male flowers above. Glumes carinate; empty ones 3–4, mucronato-acute, the lower ones subulato-ovate, the superior larger and elliptical-ovate; flowering ones: the lower one ovate and longer than the empty ones, the superior ones longer and ovato-lanceolate or lanceolate. Setae 6, unequal in length, much shorter than the achene, antrorsely scabrous. Stamens 3; filament a little exceeding the glume; anther linear. Achene orbiculato-obovate to obovate, biconvex, minutely scabro-ciliated on shoulders, thinly spinuloso-scabrous above, fulvo-castaneous, very minutely punctate, sub-thining, $1\frac{1}{2}$ – $1\frac{2}{3}$ mm. long; rostrum very short, minute, conico-deltoid, suddenly dilated at the base; style long, filiform, undivided.

Hab. Prov. BUZEN: Yazaki-mura in Usa-gōri (Harb. ! Sc. Coll. Imp. Univ. Tokyo, Sept. 1880), Jōno-mura (*M. Yano* ! Aug. 13, 1903); Prov. HYUGA: Nishigatake-mura (*R. Yatabe* and *J. Matsumura* ! herb. ibid. July 22, 1882); Prov. KII: Arashika (*J. Matsumura* and *S. Ōkubo* ! herb. ibid. July 1883); Prov. TOSA: Sakawa (*T. Makino* ! 1885), Yunoki in Hata-gōri (*T. Makino* ! Aug. 6, 1889), Godaisan (*R. Yatabe* ! herb. ibid. July 30, 1888); Prov. MIKAWA: Takashi (*T. Makino* ! Aug. 1899); Prov. HIGO: Mt. Bōshi in Amakusa (*M. Murakami* ! Sept. 1899); Prov. HIZEN: Hikosan in Nagasaki (*N. Okada* ! herb. ibid. Oct. 27, 1902); Prov. SUŌ: Ōuchimura (*D. Nikai* ! herb. ibid. Aug. 26, 1892); Prov. IDZUMI: Sunagawa (*S. Matsuda* ! Aug. 3, 1896); Loochoo: Isl. Okinawa (*S. Tashiro* ! herb. ibid. March 1887).

In all the Japanese specimens, which I have examined, the styles are not divided.

Rynchospora (Haplostylæe) **corymbosa** (Linn.) Britton ; O. Kuntze
Rev. Gen. Pl. III. 2, p. 335.

Scirpus corymbosus Linn. Amœn. Acad. IV. (1759) p. 303, et Sp.
Pl. ed. 2, p. 76 ; Richt. Cod. n. 431 ; Hoult. Nat. Hist. XXXI. p. 116 ;
Willd. Sp. Pl. I. p. 308.

Schœnus corymbosus Pers. Syn. Pl. I. p. 59.

Schœnus surinamensis Rottb. Descr. et Icon. Pl. (1786) p. 68, tab.
21, fig. 1 ; Willd. Sp. Pl. I. p. 266 ; Poir. Enc. Meth. Suppl. II. p.
247.

Rynchospora surinamensis Nees in Linnæa IX. p. 297 ; Griseb. Fl.
Brit. West Ind. Isl. (1864) p. 575.

Rynchospora aurea Vahl Enum. Pl. II. (1806) p. 229 ; R. Br. Prodr.
Fl. Nov. Holl. (1810) p. 230 ; Spreng. Syst. Veg. I. p. 196 ; Nees in
Linnæa IX. (1834) p. 297 ; Rœm. et Schult. Syst. Veg. II. p. 82 ; Kunth
Enum. Pl. II. p. 293 ; F. Muell. Fragm. Phyt. Austral. IX. p. 17, et Sec.
Syst. Cens. Austral. Pl. p. 214 ; Bœck. in Linnæa XXXVII. p. 626 ; Miq.
Fl. Ind. Bat. III. p. 336 ; Steud. Syn. Pl. Glum. Cyper. (1855) p. 144 ;
Benth. Fl. Hongk. p. 396, et Fl. Austral. VII. p. 348 ; Clarke in Hook.
fil. Fl. Brit. Ind. VI. p. 970, et in Journ. Linn. Soc. XXXIV. p. 89 ;
O. Kuntze l. c. II. p. 756 ; Henry in Trans. As. Soc. Jap. XXIV. Suppl.
p. 105.

Chaetospira aurea H. B. et K. (1815).

Schœnus articulatus Roxb. Fl. Ind. I. p. 184.

Rynchospora articulata Schult. Syst. Veg. II. Mant. p. 49 ; Spreng.
l. c. p. 197 ; Kunth Enum. l. c. p. 293 ; Steud. l. c. p. 148 ; Zoll. Syst.
Verz. Ind. Archip. I. p. 61 ; Miq. Fl. Ind. Bat. III. p. 337.

Cephaloschœnus articulatus Nees in Linnæa IX. p. 296.

Calyptrostylis articulata Nees.

Scirpus umbellatus Roxb. Ic. ined. tab. 703, ex Kunth Enum. Pl. II.
p. 294.

Schœnus floridus Rudge ; Rœm. et Schult. Syst. Veg. II. p. 83.

Calyptrostylis florida Nees.

Rynchospora florida A. Dietr. ; Schult. Syst. Veg. II. Mant. p. 45 ;
Steud. l. c. p. 145.

Calyptrostylis Gaudichaudii Nees in Linnæa IX. p. 295.

Calyptrostylis divergens Nees.

Cephaloschœnus divergens Nees in Linnæa IX. p. 296.

Rynchospora subulirostris Steud. l. c. p. 149.

Calyptrostylis fascicularis Nees.

Rynchospora Schraderiana Steud. l. c. p. 146.

Calyptrostylis asperula Nees.

(Pl. VII. fig. 2, a. b.)

Culm erect, robust, trigonous, foliate throughout, the apical portion one-sulcate with scabrous edges on one side. Leaves long, linear, about 11 mm. wide, acuminate towards the acutish apex, scabrous-margined, vagina with a short broad membranaceous ligula at the mouth. Corymbs compound, clustered into a short and broad panicle with numerous spiculae; radii several, umbellate, patent; 2nd radii subumbellato-racemosely disposed, patent, with a cluster of spiculæ towards the apex; the terminal one about 10 cm. across; the lateral ones alike as 2nd radii of the terminal one, with an erect peduncle arising from the superior axils and lower down the culm; involueral-bracts leafy, longer than the panicle, attaining about 17 cm. long and 7 mm. broad; bracts and bracteoles setaceous. Spiculæ erect and erect-patent and patulous, narrowly lanceolate, acuminate, ferrugineo-brunneus, 9-10 mm. long, with 1 perfect flower and 1 or 2 males. Empty glumes 4, subulato-ovate; flowering ones 1 longer, ovate but the superior ones ovato-lanceolate to lanceolate. Setæ 6, antrorsely scabrous, longer than the achene but lower than the rostrum of the achene. Stamens 3; filament long, lower than the rostrum of the mature achene. Achene oblong-obovate, ferrugineo-bay, compressed, with a few pits, transversely rugulose, $3\frac{1}{2}$ mm. long; rostrum slenderly subulato-conical, gradually attenuated above, dilated and as broad as the achene at the base, calyptately crowned with free margin on the achene, longer than the achene, broadly and shallowly furrowed on both faces, $5\frac{1}{2}$ mm. long; style long, 17 mm. long, very shortly bifid at the apex.

Hab. YAEYAMA ARCHIP. (*Y. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1887).

Rynchospora (*Dichostyleæ*) ***Fujiiana*** Makino, sp. nov.

(Pl. VII. fig. 3.)

Densely caespitose, green, attaining 95 cm. in height, estoloniferous; rhizome very short, densely rooting. Culm erect, very slender, setaceo-filiform above, loosely foliate, scabrous in the superior portion. Leaves angustato-linear, rigidulous, attaining $1\frac{2}{3}$ mm. broad, setaceous and trigonous and scabrous towards the acutish apex, much shorter than the culm. Corymb fasciculately 1-14-spiculose, attaining 1 cm. in diameter, often pauci-continued, the lower ones distant and peduncled, the peduncle erect and rather

short; bracts setaceous. Spiculæ erect, lanceolate, subulate, acuminate, 3-4-flowered, 5-6 mm. long, ferrugineo-brunneus. Empty glumes 3, elliptical-ovate; flowering ones oblong-ovate. Setæ 6, smooth, longer than the achene but lower than the rostrum. Stamens 3; filament exceeding the rostrum at the mature achene. Achene oblong-obovate, 2 mm. long, flavescent-subbrunneus, transversely rugulose; rostrum as long as the achene, angustato-conical; style long, deeply bifid, the branches $\frac{2}{3}$ or $\frac{1}{2}$ as long as the main portion.

Hab. Prov. TOSA: Near Sakawa in Takaoka-gōri (*T. Makino!* 1885), Yunoki in Hata-gōri (*T. Makino!* Aug. 6, 1889); Prov. MIKAWA: Takashi-hara (*G. Nagura!* Sept. 29, 1896; *T. Makino!* Aug. 1899); Prov. SUO: Ōuchi-mura (*D. Nikai!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 26, 1892).

I have named it in honour of Mr. K. Fujii, Assistant Professor of Botany in the Science College, Imperial University of Tōkyō.

var. scabriseta Makino.

(Pl. VII. fig. 4.)

Leaves attaining 2 mm. in width. Setæ antrorsely scabrous.

Hab. Prov. MIKAWA: Takashi-hara (*T. Makino!* Aug. 1899).

Rynchospora (Dichostyleæ) **Miyakeana** Makino, sp. nov.

(Pl. VII. fig. 5, a. b.)

Culm erect, attaining about 38 cm. long, very slender, stout-setaceous or setaceous, very laxly foliate, glabrous. Leaves setaceous-linear or setaceous, attaining 1 mm. wide, shorter than the culm, trigonous and scabrous above, acute at the apex. Corymb fasciculately pauci (1-3)-spiculose, terminal and axillary above, the axillary ones shortly exerted on the vagina; bracts setaceous. Spiculæ erect, narrowly lanceolate, subulate, 5-6 mm. long, 2-3-flowered, ferruginous. Glumes thinly membranaceous; empty ones ovate; flowering ones ovato-lanceolate. Setæ 6, longer than the achene, but lower than the rostrum, minutely retrorsely scabrous or smooth. Stamens 3; filament longer than the rostrum of the mature achene. Achene 2 mm. or little more long, lato-obovoid, ferruginous-brunneous, transversely rugulose; rostrum narrowly conical, attenuated above, slightly shorter than the achene; style long.

Hab. Prov. UGO: Foot of Mt. Chōkai (*I. Satō!* Oct. 1894).

I have named this in honour of Mr. Kiichi Miyake.

Rynchospora (Dichostyleæ) **japonica** Makino, sp. nov.

? *Rynchospora fusca* Miq. Prol. Fl. Jap. p. 77, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 119; Franch. et Sav. Enum. Pl. Jap. II. p. 121, non Vahl nec Lindl.

(Pl. VII. fig. 6.)

Cæspitose, green, rather robust, attaining 127 cm. in height, estoloniferous; rhizome very short, densely rooting. Culm erect, very slender, scabrous above, very loosely foliate, the largest one $3\frac{1}{2}$ mm. across at the basal portion. Leaves narrowly linear, much shorter than the culm, attaining $3\frac{1}{2}$ mm. wide, scabrous and trigonous towards the acutish apex. Corymb fasciculately 2-9-flowered, attaining 1 cm. or more in diameter, more often subcompound or compound, the lower ones distant and with the long peduncles which are often binate from a vagina; bracts angustato-linear. Spicuke lanceolate, subulate, acuminate, erect, 7 mm. long, ferrugineo-castaneous, 5-flowered. Empty glumes 3-4, ovate; flowering ones elliptical-ovate. Setæ 6, long, antrorsely scabrous, exceeding the rostrum of the mature achene. Stamens 2-3; filament lower than the style. Achene oval-obovate, bi-convex, castaneous, transversely rugulose, $1\frac{2}{3}$ mm. long; rostrum conical, slightly shorter than the achene; style very deeply bifid, the branches longer than the main portion.

Hab. Prov. HYŪGA: Nishigatake mura (*R. Yatabe* and *J. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 5, 1882); Prov. TOSA: Near Sakawa (*T. Makino*! 1884, 1885), Yunoki in Hata-gōri (*T. Makino*! Aug. 6, 1889); Prov. MIKAWA: Takashi-hara (*G. Nagura*! Sept. 9, 1896; *T. Makino*! Aug. 1899); Prov. HARIMA: Tsurui-mura (*I. Hashimoto*! Sept. 15, 1903); Prov. BUZEN: Jōno-mura (*M. Yano*! Aug. 13, 1903); Prov. TSUSHIMA: Idzunohara (*K. Hirata*! Aug. 1901), Kutamichi (*K. Hirata*! Sept. 15, 1902).

Rynchospora (Dichostylæ) ***glauca*** Vahl Enum. Pl. II. (1806) p. 233; Rœm. et Schult. Syst. Veg. II. p. 85; Spreng. Syst. Veg. I. p. 197; Kunth Enum. Pl. II. p. 297, excl. syn. pl.; Bœck. in Linnæa XXXVII. p. 585, excl. "forma major"; Steud. Syn. Pl. Glum. Cyper. (1855) p. 145; F. Muell. Fragm. Phyt. Austral. IX. p. 17, et Sec. Syst. Cens. Austral. Pl. p. 214; Benth. Fl. Austral. VII. p. 349; Clarke in Hook. fil. Fl. Brit. Ind. VI. p. 671, et in Journ. Linn. Soc. XXXIV. p. 90; O. Kuntze Rev. Gen. Pl. II. p. 756, et III. 2, p. 335; Pears. in Journ. Linn. Soc. XXXIV. p. 358.

Rynchospora lawa R. Br. Prodr. Fl. Nov. Holl. (1810) p. 230; Nees

in Linnæa VIII. p. 94, et IX. p. 297; Kunth l. c. p. 298, excl. syn.;
Miq. Fl. Ind. Bat. III. p. 337; Steud. l. c. p. 148; Benth. Fl. Hongk. p.
397; Hillebr. Fl. Haw. Isl. p. 476, non Vahl.

Schœnus laxus Poir. Encycl. Meth. Suppl. II. p. 252.

Rynchospora laxa β . *minor* Thw.

Schœnus gracilis Sw.

Rynchospora gracilis Vahl l. c. p. 234; Rœm. et Schult. Syst. Veg.
II. (1817) p. 86; Steud. l. c. p. 145; Griseb. Fl. Brit. W. Ind. Isl. p. 574.

Rynchospora Brownii Rœm. et Schult. l. c. p. 86; Nees in Linnæa
X. p. 185; Bæck. in Linnæa XXXVII. p. 581.

Rynchospora petræa Nees; Steud. l. c. p. 147.

Rynchospora effusa Schrad. mss. ex Steud. l. c. p. 147.

Rynchospora chinensis Nees herb. partim, ex Bæckel.

Chætospora ferruginea H. B. et K. (1815); Schlecht. et Cham. in
Linnæa VI. p. 28.

Rynchospora ferruginea Rœm. et Schult. Syst. Veg. II. (1817) p. 85,
et Add. II. p. 529; Spreng. l. c. p. 197; Nees in Linnæa VII. p. 529.

Gahnia ferruginea Willd. herb. ex Schult.

Rynchospora brunnea Willd. herb. ex Schlecht. et Cham. in Linnæa
VI. (1831) p. 28.

Rynchospora castanea Nees et Meyen herb. ex Kunth l. c. p. 298.

Schœnus pauciflorus Willd. herb. ex Kunth l. c. p. 298.

Rynchospora lavarum Nees herb. non Gaudich. ex Kunth l. c. p. 298

Rynchospora Thouarsii Nees in Linnæa IX. (1834) p. 297.

Rynchospora vicozensis Schult. Syst. Veg. II. Mant. p. 46; Kunth
l. c. p. 302; Steud. l. c. p. 147.

Chætospora vicozensis Schrad. ms. ex Schult. Syst. Veg. II. Mant. p. 46.

Schœnus rugosus Vahl; Pers. Syn. Pl. I. p. 59; Poir. Enc. Meth.
Suppl. II. p. 249.

Rynchospora juncea Willd. herb. ex Kunth l. c. p. 298.

Rynchospora capillata Vahl l. c. p. 235.

Rynchospora rigida Schrad. herb. ex Kunth l. c. p. 297.

Rynchospora lævis Schlecht. in Linnæa XXV. (1852) p. 166.

(Pl. VII. fig. 7, a. b. c.)

Cæspitose, green, estoloniferous, attaining 86 cm. in height; rhizome very
short. Culm erect, slender, angular, very laxly foliate, scabrous above.
Leaves angustato-linear, much shorter than the culm, attaining 3 mm. broad,
trigonous and scabrous towards the acutish apex. Corymb compound,
rather loosely many-spiculate, terminal and axillary above, the terminal one

larger and attaining about 3 cm. across, the lateral ones distant and with rather long peduncles; radii several, unequal, erect or erect-patent; bracts leafy; bracteoles setaceo-linear or setaceous. Spiculae oblong-ovate, acute, ferrugineo-brunneus, 3-4-flowered, $4\frac{1}{2}$ mm. long. Empty glumes 3-4, elliptical-ovate; flowering ones larger and broadly ovate. Setae 6, unequal in length, shorter or slightly longer than the achene, antrorsely scabrous. Stamens 3-1; filaments exceeding the rostrum of the mature achene. Achene oval-obovate, $1\frac{2}{3}$ mm. long, biconvex, ferrugineous, transversely rugulose; rostrum shorter than the achene, lato-conical, strong, dilated at the base; style deeply bifid, the branches as long as the main portion.

Hab. Prov. KŪ: Iwashiro (*J. Matsumura* and *S. Okubo!* herb. Sc. Coll. Imp. Univ. Tokyo, July 23, 1883); Prov. TOSA: Ichinose in Hata-gōri (*T. Makino!* Aug. 2, 1889), Kōchi (*K. Naganuma!* 1886), Godaisan (*R. Yatabe!* herb. ibid. July 30, 1888); Prov. IYO: Near Matsuyama (*Z. Umemura!* July 4, 1897); Prov. TORŌMI: Nobe-mura in Toyoda-gōri (*M. Hisamatsu!* herb. ibid. Sept. 1893); Prov. HIGO: Hankawauchi in Amakusa (*M. Murakami!* Aug. 19, 1903); Prov. ISE: Kabuto in Suzuka-gōri (*Y. Ujematsu!* Oct. 4, 1903); LOOCHOO: Kunchan in Isl. Okinawa (*H. Kuroiwa!* May 1897).

Rynchospora (Dichostyleæ) **Umemuræ** Makino, sp. nov.

(Pl. VII. fig. 8, *a. b.*)

Cæspitose, attaining about 50 cm. in height, estoloniferous; rhizome very short, with fibrous roots. Culm erect, very slender, setaceous, one-sulcate on one side, scabrous above, laxly short-branched, very laxly corymbiferous throughout. Leaves setaceo-linear, 1 mm. or little more wide, much shorter than the culm, trigonous and scabrous towards the obtuse apex. Corymbs fasciculately 2-4-spiculose; bracts setaceous, scabrous. Spiculae erect, 2-3- sometimes 1-flowered, elliptico-ovate, shortly acuminate, ferrugineo-brunneus, 3- $3\frac{1}{2}$ mm. long. Empty glumes 2, ovato-lanceolate, very thin; flowering ones ovate. Setae 6, slightly longer than the achene, fulvous, antrorsely scabrous. Stamen 1; filament lower than the rostrum of the mature achene. Achene oval-obovate, biconvex, pale-flavescent with a slight ferruginous stain, transversely sub-rugulose, $1\frac{1}{3}$ mm. long; rostrum angustato-conical, shorter than the achene; style deeply bifid, branches $\frac{2}{3}$ as long as the main portion.

Hab. Prov. ISE: Heki-mura (*Z. Umemura!* Oct. 6, 1895).

Very closely allied to *Rynchospora Hattoriana* Makino, but setae are

scabrous upwards, and spiculæ are somewhat shorter; probably it is a variety of that species.

Rynchospora (Dichostyleæ) **Fauriæ** Franch. in Bull. Soc. Philom. Paris, 27 mars 1886, p. 4.

(Pl. VII. fig. 9.)

Cæspitose, green, estoloniferous; rhizome short, ascending, densely rooting. Culm erect, attaining 73 cm. in height, slender, scabrous in the apical portion, very laxly foliate. Leaves rigid, angustato-linear, attaining 3 mm. broad, trigonous in the apical portion, obtuse at the apex, scabrous-margined, much shorter than the culm. Corymbs 3-8, more or less compound, fasciculately 6-9-spiculose: apical ones subcontinued, with floral bracts which are slightly exerted; inferior ones distant and long-peduncled, sometimes binate from a vagina; bracts angustato-linear, attaining 2 mm. wide; floral bracts very angustately subulato-linear. Spiculæ erect, linear-lanceolate, subulate, acuminate, 2-6-flowered, brunneo-rufescent, 8-10 mm. long. Empty glumes 3, oblong-ovate; flowering ones ovato-lanceolate. Setae 6-5, finely capillary, delicately retrorsely piloso-scabrous, 3-3½ times as long as the mature achene. Stamens 3; filament as long as setæ. Achene oval-obovate, biconvex, transversely rugulose, 1⅓ mm. long, ferruginous; rostrum acuminately conical, scarcely equal to the achene in length, the base slightly abruptly dilated; style deeply bifid, the branches long, filiform, longer or much so than the main portion.

Hab. Prov. IWAISHIRO: Yama-gōri (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 11, 1879); Prov. MUTSU: Kuniyoshi-mura (*T. Iwakawa!* herb. *ibid.* July 30, 1880), Okitate-mura in Higashi-tsugaru-gōri (*H. Sakurai!* herb. Imp. Househ. Mus. Aug. 1885), Hyakuzawa (*H. Sakurai!* herb. Imp. Househ. Mus. Aug. 1885); Prov. SHINANO: Togakushi (*H. Sakurai!* herb. Imp. Househ. Mus. Aug. 6, 1892), Nigori-zawa in Togakushi (Herb. Imp. Househ. Mus. Aug. 10, 1885); Prov. MIKAWA: Takashi-hara (*H. Sakurai!* herb. Imp. Househ. Mus. July 1903); Prov. ISE: Mt. Tarusaka in Miyegōri (*K. Imai!* June 7, 1903).

Rynchospora (Dichostyleæ) **Yasudana** Makino, sp. nov.

(Pl. VII. fig. 10.)

Cæspitose, estoloniferous, attaining 33 cm. in height; rhizome ascending, covered with scaly leaves. Culm erect, very gracile, setaceo-filiform, slightly

scabrous above, laxly foliate. Leaves much shorter than the culm, angustato-linear, attaining 2 mm. wide, trigonous and scabrous towards the obtuse apex. Corymb 1 or approximately 2-3-spiculose, lower ones long-peduncled; peduncle erect; bracts setaceo-linear, but superior ones setaceous. Spiculæ erect, angustato-lanceolate, or lanceolate, acuminate, 2-3-flowered, 5-6 mm. long, ferrugineo-brunneus. Empty glumes 2, ovato-lanceolate; flowering ones oblong-ovate or elliptico-ovate. Setæ 6, usually longer than the achene but lower than the rostrum, retrorsely scabrous. Stamens 2. Achene narrowly oblong, smooth, pale-flavescent, 2-2½ mm. long; rostrum angustato-conical, equal to or shorter than the achene; style slender, 2-fid above, the branches about $\frac{1}{3}$ as long as the main portion.

Hab. Prov. Echigo: Mt. Shimidzu-tōge (*T. Makino!* Sept. 1888); Prov. Kikuchū: Mt. Kurikoma (*T. Makino!* Aug. 1890); Prov. Rikuzen: Mt. Katta-dake (*Y. Yabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 17, 1898).

An allied species to the North-American *Rynchospora capillacea* Torr. I have named this species in honour of Mr. Atsushi Yasuda, Professor of Biology in the Fourth High School in Sendai, prov. Rikuzen.

Rynchospora (Dichostyleæ) **Hattoriana** Makino, sp. nov.

(Pl. VII. fig. 11.)

Cæspitose, green, attaining 55 cm. in height, estoloniferous; rhizome very short, with dense fibrous roots. Culm erect, slender, setaceo-filiform above, one-sulcate on one side, subscabrous in the apical portion, laxly foliate, laxly branched and dispersedly and distantly corymbiferous throughout, the branches erect, very much shorter than the culm. Leaves much shorter than the culm, angustato-linear, attaining 1⅔ mm. wide, trigonous and scabrous towards the obtuse apex. Corymbs small, fasciculately 3-7-spiculose, attaining 5 mm. across; the lateral ones shortly peduncled; bracts setaceous. Spiculæ erect, 2-3-flowered, ovato-lanceolate, shortly acuminate, ferrugineo-brunneus, 3½ mm. long. Empty glumes 2-3, narrowly ovate; the flowering ones ovate or elliptico-ovate. Setæ 6, slightly longer than the achene, ferruginous, retrorsely scabrous. Stamen 1; filament equal to the rostrum of the mature achene in height. Achene orbiculato-obovate or broadly obovate, biconvex, castaneous, or pale-stramineous and sometimes with a castaneous stain, transversely slightly rugulose, 1½ mm. long; rostrum angustato-conical, slightly shorter than the achene; style deeply bifid, the branches $\frac{1}{2}$ as long as the main portion.

Hab. Prov. Sagami: Hokone (*T. Makino!* Sept. 15, 1886); Prov.

IWASHIRO: Mt. Shinobu (*K. Nemoto!* Sept. 12, 1894); Prov. MUKAWA: Takashi-hara (*T. Makino!* Aug, 1899).

I have named this in honour of Mr. H. Hattori of the Botanical Institute, Science College, Imp. Univ. Tokyo.

Rynchospora (Dichostyleæ) **alba** Vahl Enum. Pl. II. (1806) p. 236; Willd. Enum. Pl. Hort. Bot. Berol. (1809) p. 71; Spreng. Syst. Veg. I. p. 194; Lindl. Syn. Brit. Fl. ed. 2, p. 297; Reichb. Fl. Germ. Excurs. p. 74 (1830); Nees in Linnæa IX. (1834) p. 279, excl. *var. fusca*; Kunth Enum. Pl. II. (1837) p. 295; Nutt. Gen. N. Amer. Pl. p. 33; Rœm. et Schult. Syst. Veg. II. p. 87, Mant. p. 48, et Add. II. p. 529; Bœck. in Linnæa XXXVII. p. 570; Hook. Fl. Bor. Amer. II. p. 233; Ledeb. Fl. Ross. IV. p. 259; Steud. Syn. Pl. Glum. Cyp. p. 149; Nyman Syl. Fl. Eur. p. 390; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 640; Sowerby's Engl. Bot. X. p. 46, tab. 1582; A. Gray Man. Bot. ed. 5, p. 569; Benth. Handb. Brit. Fl. ed. 5, p. 473; Hook. fil. Stud. Fl. Brit. Isl. ed. 3, p. 446; Miq. Prol. Fl. Jap. p. 77, et Cat. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 119; Franch. et Sav. Enum. Pl. Jap. II. p. 121; Brit. et Br. Ill. Fl. N. Un. St. et Can. I. p. 277, fig. 651.

Schœnus albus Linn. Sp. Pl. p. 44; Richt. Cod. n. 373; Houtt. Nat. Hist. XXXI. p. 58; Lamk. Enc. Meth. Bot. I. p. 741; Willd. Sp. Pl. I. p. 267; Pers. Syn. Pl. I. p. 59; Ait. Hort. Kew. ed. 2, I. p. 127; Michx. Fl. Bor. Amer. I. p. 34.

Mariscus albus Gilib.

Rynchospora alba var. *a.* Vahl. l. c. p. 236.

(Pl. VII. fig. 12, *a. b.*)

Cæspitose, green, estoloniferous, attaining 50cm. or more in height; rhizome very short, densely and fasciculately rooting. Culm erect, slender, very laxly pauci-foliolate, sub-scabrous above. Leaves angustato-linear or setaceo-linear, attaining 2mm. broad, much shorter or sometimes more or less longer than the culm, trigonous and scabrous in the apical portion, obtuse at the apex. Corymb flat on the top, capitately subcompound in the terminal one and attaining 1½cm. in diameter, the lateral one none or usually one or rarely two, in small cluster and peduncled, arising from the superior axils; outer floral bracts slightly exceeding the corymb, setaceous. Spiculae fasciculate, nearly white, but pale fulvous when dried, linear-lanceolate, subulate, 6mm. long, 2-flowered. Empty glumes 3-5, ovato-lanceolate; flowering ones longer, oblong-lanceolate. Setae 11-14, unequal in length, the longest one equal to or slightly exceeding the rostrum of the mature achene, retrorsely scabrous, but antorsely plumoso-ciliated at the

base, pale-fulvous. Stamens 2; filament lower than the style. Achene elliptico-obovate, contracted at the base, biconvex, 2mm. long, pale-flavescent or pale-fuliginous, nearly smooth; rostrum slightly shorter than the achene, conical, acuminate; style deeply bifid, the branches $\frac{2}{3}$ as long as the main portion.

Hab. HOKKAIDŌ (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tōkyō, Aug. 1878); Prov. SUŌ: Osaba-mura (*D. Nakai!* herb. ibid. June 27, 1891); Prov. MIKAWA: Takashi (*G. Nagura!* Sept. 9, 1896; *T. Makino!* Aug. 1899); Prov. SHIMA: Hazako (*Z. Umemura!* Aug. 2, 1893); Prov. SHINANO: Mt. Togakushi (*K. Watanabe!* Aug. 20, 1893); Prov. UGO: Kotaki in Kamigō-mura, Yuri-gōri (*K. Nishiwada!* Sept. 1903); Prov. SHIMOTSUKE: Akanuma-no-hara in Mt. Nikkō (*T. Makino!* Sept. 1903).

var. kiusiana Makino, var. nov.

Robuster than the type, attaining 55cm. in height. Stem attaining 2mm. in diameter. Corymb compound, attaining $2\frac{1}{2}$ cm. across; radii about 2-5, unequal, peduncled, the peduncle attaining $3\frac{1}{2}$ cm. in the longest one. Setæ 9-11.

Hab. HYŪGA: Tsuno (*K. Saida* and *H. Sakurai!* herb. Imp. Househ. Mus. Aug. 10, 1891).

Ligularia Schmidtii (Maxim.)

Senecillis Schmidtii Maxim. in Mém. Biol. VIII. p. 16, (1871).

Senecio Schmidtii Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 246; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 457.

Raceme 26cm. long in my specimen.

Icon. Inuma's Sōmoku-Dzusetsu XVII. fol. 30 recto, n. 26.

Hab. Prov. MUTSU: Same, near sea (*Y. Yamasaki!* no. 23, August 1903).

This is occasionally found growing wild in the middle (after Y. Inuma) and northern Japan. The Yamasaki's recent collection surely proves that besides Mandshuria this species is also found in Japan. It is probably erroneous that man says that it grows in Loochoo.

Polygonum (Bistorta) **hayachinense** Makino, sp. nov.

Quite glabrous, attaining about 25cm. in height. Rhizome thick, ligneous, tortuous, repent, nigro-castaneous; roots nigrescent. Stem erect, annual, narrow, simple, monostachyus, remotely 2-4-leaved. Leaves chartaceous, subcrispate and narrowly revolute margined, subglaucous beneath, the

both surfaces venoso-reticulated with veinlets; radical ones long-petiolate, oblong-lanceolate, ovate-lanceolate, oblong, or ovate, obtuse, subtruncato-rounded or subcordato-truncate at the base, with many and erect-patent lateral veins, 6-8cm. long, $2\frac{1}{3}$ -3cm broad; petiole slender, apterous, with a long membranaceous sheath, attaining 8cm. long; cauline leaves much smaller, shortly but distinctly petiolate, ovate to linear-lanceolate, obtuse, rounded-obtuse at the base, but the superior ones acute at the base, the uppermost one sometimes reduced into a setaceous shape, the sheath long, the superior free portion fulvous and thinly membranaceous, subtruncate but the inferior ones bifid. Raceme terminal, dense-flowered, oblong-cylindrical, $1\frac{1}{2}$ - $2\frac{2}{3}$ cm. long, 1- nearly $1\frac{1}{2}$ cm. across, continued, pedunculate; bracts thinly membranaceous, ovate or subulato-ovate, acuminate-acute, one-nerved, ferruginous, 3- $4\frac{1}{2}$ mm. long; bracteoles vaginate, obliquely truncate, thinly membranaceous. Flowers pedicellate, campanulate, 5mm. across, rose; pedicel shorter than the flower. Perianth deeply 5-parted; segments oblong to angustato-oblong, obtuse. Stamens 8, about equal to the perianth in height, inserted to the base of the perianth; filament subulato-filiform; anther elliptical, dorsifixed, the cells lunato-oblong, closely placed but free each other. Ovary elliptical, shortly attenuated on both ends, trigonous; styles 3, exserted, much longer than the ovary, erect, filiform; stigma terminal, punctate. Achene (immature) elliptical, acute on the both ends, trigonous, smooth.

Hab. Prov. RIKUCHŪ: Mt. Hayachine (*C. Wagawa!* no. 174, July 1900; *O. Satō!* no. 138, July 28, 1902; *G. Toba!* no. 70, Aug. 8, 1903; *T. Someya!* herb. Sc. Coll. Imp. Univ. Tōkyō, July 7, 1903).

The reticulation of the veinlets and thickness of the leaves resemble those of *Polygonum viviparum* Linn.

Cypripedium guttatum Swartz var. **Yatabeanum** (Makino) Pfitz. Orchid.-Pleon. in Engler's Pflanzenr. IV. 50, (1903) p. 33.

Cypripedium Yatabeanum Makino in Bot. Mag., Tōkyō, XIII. (1899) p. 91.

Lower sepals (which are connate into one) viridescens, shaded with a light purpurascens-brown towards the margin; the upper sepal pale-yellowish and purpurascens-brown on the margin externally, yellow-purpurascens-brown internally. Petals whitish, blotched with purpurascens-brown colour, villose with pale hairs at the base internally. Labellum yellow, maculato-nebulous with purpurascens-brown, yellow on the inflexed margin, villose with

white hairs at the base internally. Staminode white, but yellow towards the base, with a row of yellowish-green spots along the upper margin. Gynostemium pale-yellowish. Ovary viridescens, glanduloso-pubescent with white hairs. Bract green. Leaves green, but nigrescent when dried. Stem and peduncle viridescens.

The above description is from the living specimen sent by Mr. Kōichi Tanaka, who collected it on Mt. Togakushi in the province of Shinano, on June 1903.

Protolirion Miyoshia-Sakurarii Makino.

Miyoshia Sakurarii Makino, vide supra, cum tab. V.

When the Bornean *Petrosavia* Beccari (with one species of *P. stellaris* Becc.) proves to be identical with *Protolirion* Ridley (P. Groom, On a New Saprophyte Monocotyl. in Ann. Bot. IX. 1895, p. 57), my above name should properly be altered to **Petrosavia Miyoshia-Sakurarii** Makino.

The Japanese species differs from the Malayan *Protolirion paradoxum* Ridley (l. c.), by the evaginate scales on the rhizome, longer and not connate vaginate inferior scaly leaves, narrow-subpaniculato-racemose or racemose and many-flowered inflorescence, shorter pedicels, entire bracts, deltoid sepals, and lato-ovate anther, etc.

The occurrence of this genus in Japan is unquestionably very remarkable.

I said it is perhaps better to establish for it a new order, *Miyoshiaceae*, if the claim is proper this name must be emended to *Protoliriaceae* (possibly *Petrosaviaceae*).

Lonicera (Xylosteon) **Amherstii** (hort.) Dippel Handb. Laubholz. I. (1889) p. 263, fig. 175.

Caprifolium Amherstii O. Kuntze Rev. Gen. Pl. I. (1891) p. 274.

Lonicera pilosa Maxim. in Mém. Biol. X. p. 73, (1877); Franch. et Sav. Enum. Pl. Jap. II. p. 653; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 597, non Willd.

Nom. Jap. *Arago-hyōtamboku* (K. Miyabe).

Hab. Prov. MŪRSU: Mt. Towada (*Y. Yamasaki!* no. 4, June 1902).

Remarkable by the large ovate bracts among the Japanese *Loniceras*; it is only found in northern Japan.

Lonicera (*Chamaecerasus*) **Maackii** (Rupr.) Herd. Pl. Radd. III. 1, (1864) p. 15, tab. 2, fig. 4; Maxim. in Mém. Biol. X. p. 66, (1877), et in Regel Gartenfl. (1884) p. 225, tab. 1162; Trautv. in Act. Hort. Petrop. VIII. p. 414; Franch. et Sav. Enum. Pl. Jap. II. (1879) p. 652; Baker et S. Moore in Journ. Linn. Soc. XVII. p. 383; Dippel Handb. Laubholz. I. p. 241, fig. 153; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 364; Palib. Consp. Fl. Kor. I. p. 104; Bretschn. Hist. Eur. Bot. Disc. Chin. pp. 465, 614, 616; Diels in Engler's Bot. Jahrb. XXIX. p. 596.

Xylosteum Maackii Rupr. in 'Bull. Phys.-Math. Acad. Pétersb. XV. (1857) p. 369,' et in Mém. Biol. II. p. 548, (1857), et Dec. Pl. Amur. (1859) tab. 8; Maxim. Prim. Fl. Amur. (1859) p. 136; Trautv. in Act. Hort. Petrop. VIII. p. 416.

Caprifolium Maackii O. Kuntze Rev. Gen. Pl. I. (1891) p. 274.

Nom. Jap. *Hana-hyōtamboku* (nov.).

Hab. Prov. MUTSU: Mt. Hashikami (Y. Yamasaki! no. 93, May 1903).

Distrib. Mandshuria and China.

Aruncus sylvester Kostel. **var. astilboides** (Maxim.) Makino.

Aruncus astilboides Maxim. Adnotat. Spirea. in Act. Hort. Petrop. VI. (1879) p. 171; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 595.

Spirea Aruncus var. astilboides Maxim. mss. in schedul. ex Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 121; Wenzig in Flora, (1888) p. 290.

Nom. Jap. *Miyama-yamabukishōma* (T. Makino).

Hab. Prov. RIKUCHŪ: Mt. Hayachine (*G. Toba!* no. 12, Aug. 8, 1903).

Phænosperma globosum Muuro in Benth. Notes on Gram. in Journ. Linn. Soc. XIX. (1882) p. 59; Franch. Pl. Dav. I. p. 326; 'Hook. Icon. Pl. tab. 1991, (1891)'; Hackel in Engl. et Prantl Nat. Pfl.-Fam. II. 2, p. 321; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 862; Pilger in Diels Fl. Centr-Chin. in Engler's Bot. Jahrb. XXIX. p. 222.

Perennial, tall, attaining about $1\frac{1}{2}$ m. or more in height. Rhizome short, repent, ramose, ligneous, nigrescent, clothed with old sheaths above, rooting, with very close nodes. Culm erect, often geniculate below, slender, terete, fistulose, green, finely striate when dried: nodes remote, glabrous, hardly prominent. Leaves thinly chartaceous, resupinate by the twisting of the base; radical ones tufted, linear or linear-lanceolate, gradually long-

acuminate, glabrous and green above, finely scabrous and glaucous beneath, scabrous-margined, contracted into a slender petiole at the base, attaining about 60 cm. long, 7-25 mm. broad; midrib slender; lateral main veins 4-5 on each side; veinlets close; ligule produced, subulato-lanceolate, obtuse, chartaceo-membranaceous, about 10-25 mm. long; sheath long, glabrous or scabrous, straight, striate; cauline leaves loosely placed, broader than the radical ones, linear-lanceolate or angustato-lanceolate, gradually long-acuminate, gradually cuneato-attenuated towards the base, attaining 50 cm. long, $3\frac{1}{2}$ cm. broad, finely scabrous on the margin and both surfaces, green above, subglaucous beneath; midrib slender; lateral main veins about 5-7 on each side; ligule produced, ovato-lanceolate, membranaceous, about 7-13 mm. long; sheath long, glabrous, terete, striate, glabrous on margin. Panicle large, erect, pyramidal-conical or pyramidal-ovate, attaining 45 cm. long, 24 cm. wide, very loose, remotely with 7-8-verticils; common rachis straight, slender, terete, subscabrous; branches patent, verticillate or semi-verticillate with sub-numerous to few unequal ones, rigidulous, capillaceous, scaberulous, usually with loose and adpressed branchlets, the longest one attaining about 21 cm. Spiculæ 1-flowered, solitary, laxly and secundly disposed, articulated to the top of pedicels, adpressed or erect-patent, oblong-linear or lato-linear, acute at the apex, more or less narrowed below, terete, viridescent, 4-5 mm. long, the lateral ones very shortly pedicellate. 1st glume oblong-lanceolate, obtuse, hyalino-membranaceous, minutely scabro-ciliated, with 1 nerve not reaching to the top, or 3-nerved at the base, about $2\frac{1}{2}$ mm. long; 2nd glume longer than the 1st one, ovate-lanceolate, obtuse, entire, hyaline, extremely thin towards the upper margin, nearly smooth dorsally, with 3 nerves which exceed the middle but not reach to the top and are connected with a venule above, about 3 mm. long; 3rd glume scarcely longer than the 2nd one, elliptico-ovate, obtuse, light green, hyalino-membranaceous towards the margin, strongly 3-nerved, sometimes sub-5-nerved, nearly smooth dorsally, about $3\frac{1}{3}$ mm. long; 4th glume slightly longer than the 3rd one, lato-elliptical, obtuse-truncate at apex, hyalino-membranaceous towards the apex and margins, pale and thinly membranaceous in centre, strongly remotely 2-nerved, subtilely scaberulous externally, involving the genitals, light green towards the nerves, subhyalino-membranaceous and one-folded in centre, not carinate, about 4 mm. or more long. Lodicules 3, as long as the ovary, ovate, oblique, shortly acuminate or subobtuse, entire, hyalino-membranaceous, two of them thick at the base. Stamens 3, exserted; filament filiform, not exceeding the spicula; anther oblong-linear, about $3\frac{1}{3}$ mm. long, the cells acute at the apex,

obtuse at the basal end. Ovary obovato-fusiform or obovato-oblong, 1 mm. long, smooth; styles 2, erect, plumose, pale, distinct or very shortly connate at the base. Caryopsis obovoid-globose or oval-globose, somewhat oblique, mucronulate at the top, more or less transversely rugose, shorter than the fruiting glumes but half-exposed, brown, $2\frac{1}{2}$ mm. long.

Nom. Jap. *Taki-kibi* (in Iyo), *Kashima-gaya* (in Nagoya).

Hab. Prov. IYO: Dōgo (*T. Nagasawa*! May 1889; *Z. Umemura*! Aug. 1897), Fudzinoishi (*Y. and T. Yoshinaga*! August 1890), Uwazima (*Z. Umemura*! June 7, 1896); Prov. MIKAWA: Kaikuku, cult. from Nagoya (*G. Nagura*! n. 397, June 20, 1900); Prov. TSUSHIMA: Idzugahara (*Y. Yabe*! July 25, 1901), Kutamichi (*K. Hirata*! July 6, 1902); Prov. BITCHŪ: Kawanose in Kamiichi-mura (*Z. Yoshino*! June and July 1, 1902), Takahashi, cult. from Kawanose (*Z. Yoshino*! July 7, 1903).

This grass is new to the Flora of Japan, and not uncommon in south-western parts of this country, having the remarkable caryopsis.

Distrib. China.

Anthoxanthum odoratum Linn. Cod. n. 227.

Culm attaining 38 cm. in height including the spike. Leaves thin, glabrous, attaining 5 mm. broad. Panicle spiciform, 3–4 cm. long; rachis and pedicel glabrous. Inferior 2 glumes quite glabrous and shining.

Hab. Prov. KITAMI in Hokkaidō: Mt. Rishiri in Isl. Rishiri (*T. Makino*! Aug. 1903).

It grows among grasses on and near the summit of the mountain. New to the Japanese Flora.

Eriophorum japonicum Maxim. in Mém. Biol. XII. p. 558, (1886).

Perennial, attaining 45 cm. in height. Leaves short, linear or linear-lanceolate. Corymb compound; radii several, all reclinate to one side, scabrous, the outer ones provided with second radii, the outmost one sometimes attaining 6 cm. long, the interior ones shorter and monostachyus. Bract nigro-viridescent excepting the apical portion; bracteoles and spicula nigro-viridescent. Glumes 1-nerved. Setae 6, delicately filiform, antrorsely scabrous above, complicate, pale-fulvous, slightly exceeding the style and about $6\frac{1}{2}$ mm. long in fruit. Stamens 3; filament filiform, lower than the style. Achene obovato-oblong, compressed and trigonous, smooth, stramineous, mucronulate with the very base at the style, $1\frac{3}{8}$ mm. long; style

exserted, deeply 3-fid, the branches ferruginous, densely and patently papillose, shorter than the main portion which is glabrous.

Nom. Jap. *Takane-kurosuge* (T. Makino).

Hab. Prov. RIKUCHŪ: Mt. Kurikoma (*T. Makino!* Aug. 1890); Mt. Hayachine (*C. Wagawa!* n. 179, July 1900; *O. Satō!* n. 115, July 28, 1902; *G. Toba!* n. 76, Aug. 8, 1903).

The setae not becoming cottony in fruit.

Alsine macrocarpa (Pursh) Fenzl 'Verbreit. Alsin. in tab. ad p. 18,' et in Ledeb. Fl. Ross. I. p. 353.

Arenaria macrocarpa Pursh Fl. Am. Sept. I. p. 316; Spreng. Syst. Veg. II. p. 399; DC. Prodr. I. p. 405; Cham. et Schlecht. in Linnaea I. p. 55; Hook. Fl. Bor. Amer. I. p. 101; Torr. et Gray Fl. N. Amer. I. p. 182; Regel Pl. Radd. I. 2, p. 354, excl. syn. plur.; Robins. in A. Gray Syn. Fl. N. Amer. I. 1, p. 247.

Alsine macrocarpa a. typica et β. sibirica Regel l. c. p. 356, tab. 1, figs. 6-11.

Arenaria arctica var. *β. grandiflora* Hook. l. c. p. 100, tab. 34, fig. B.

Alsine arctica var. *breviscapa* Regel. l. c. p. 347.

Arenaria heteromalla Rudolphi in herb. ex Fenzl in Ledeb. l. c.

Alsine Jooi Makino in Bot. Mag., Tokyo, XVII. p. 12.

Alsine macrocarpa var. *Jooi* Makino l. c. p. 38.

Flowers 7-10 cm. long; pedicel attaining 8 mm. in length. Petals apparently exceeding the sepals. Styles 3.

ADD. *Hab.* Prov. SHINANO: Mt. Yatsugatake (*H. Takeda!* July 27, 1903), Mt. Yarigatake in Minami-adzumi-gōri (*T. Imori!* Aug. 1903).

Gentiana (Chondrophylla) ***nipponica*** Maxim. var. ***Kawakamii*** Makino, var. nov.

Perennial, 5-14 cm. in height, glabrous, densely intricato-caespitose (the tuft attaining about 12 cm. in expansion), with fibrous roots. Stems decumbent and ramose and gracile below, densely foliate, the sterile ones immersed among the leaves. Leaves thickish, herbaceo-coriaceous, narrowly recurved on the margin when dried, subrecurvo-patent, ovato-lanceolate to lato-ovate, obtuse or acutish, sessile and connate at the base, attaining 17 mm. long, 7 mm. wide, trinerved; floriferous stem ascending, longer than the sterile stem, loosely ramose above, angulate, the internodes often

longer than the leaves above. Flower very shortly pedicellate, erect, 1 or mostly corymbose-disposed, 2-3 cm. long. Calyx campanulate, green, about 9-11 mm. long, 5-6-fid; lobes lato-ovate to orbicular, acute, shorter than the tube, erect or sub-erect-patent, about $3\frac{1}{2}$ mm. long. Corolla thrice to twice and a half as long as the calyx, deep-violet, with green spots in the throat; tube lato-cylindrical; limb patent, elliptical or orbiculate, rounded-obtuse at the apex, 6-8 mm. long; plaits erect, about 4 mm. long, deltoid or deltoid-ovate, eroso-fimbriate or irregularly fimbriate, often bifid at the apex. Stamens slightly lower than the corolla-tube; filament subulate, glabrous; anther oblong. Pistil equal to the stamens in height; ovary oblong, compressed, abruptly reduced into the style, lato-stipitate; the stipe longer than the ovary; style short, bifid, the arms spatulate, rounded at the apex, minutely papillose internally. Capsule much exserted above the persistent corolla, long-stipitate, rounded, compressed.

Hab. Prov. KITAMI in Hokkaidō: Mt. Kishiri in Isl. Rishiri (*Takiya Kawakami!* Aug. 1899; *T. Makino!* Aug. 1903).

A charming one, larger than the type. Corolla more deeply coloured, plaits fimbriate, and calyx-lobes broader. I have a specimen from Mt. Iide in the province of Iwashiro, collected by K. Nemoto, Aug. 25, 1895, which probably belongs to our variety, having narrowly ovate or ovato-lanceolate calyx-lobes and less fimbriate plaits.

Suæda glauca Bunge in *Mél. Biol.* X. p. 293, n. 40, (1879), et *Salsol. Herb. Petrop.* in *Act. Hort. Petrop.* XIII. p. 21; Trautv. in *Act. Hort. Petrop.* IX. p. 398; *Herd. Pl. Radd. Apetal.* in *Act. Hort. Petrop.* X. p. 627; Franch. *Pl. David.* I. p. 251; Forbes et Hemsl. in *Journ. Linn. Soc.* XXVI. p. 328; Makino in *Bot. Mag., Tokyo*, XI. (1897) p. 70; Palib. *Consp. Fl. Kor.* II. p. 33.

Schoberia glauca Bunge *Enum. Pl. Chin. Bor.* (1831) p. 59, n. 310.

Chenopodina glauca Moq. in DC. *Prodr.* XIII. 2, p. 162; Maxim. *Prim. Fl. Amur. Suppl. Ind. Fl. Pek.* p. 476, et *Ind. Fl. Mongol.* p. 484.

Suæda Stauntoni Moq. *Chenop. Enum.* (1840) p. 131.

Salsola? *asparagoides* Miq. *Prol. Fl. Jap.* p. 126; Franch. et Sav. *Enum. Pl. Jap.* I. p. 388.

Suæda asparagoides Makino in *Bot. Mag., Tokyo*, VIII. (1894) p. 382.

Schoberia maritima var. *asparagoides* Franch. et Sav. *Enum. Pl. Jap.* II. p. 470.

Chenopodiina maritima Sieb. non Moq. ex Bunge.

? *Schoberia maritima* Miq. l. c. pp. 126, 359; Franch. et Sav. l. c. I. p. 388, non C. A. Mey. excl. syn.

Nom. Jap. *Matsuna*.

Hab. Prov. AWA [Bōshū] (Herb. ! Sc. Coll. Imp. Univ. Tokyo); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb. ! ibid. 1879, 1880; *T. Makino* ! Sept. 27, 1895, Sept. 1903); Prov. AWA in Shikoku: Okisu-ura, spont. (*G. Kuradzuka* ! Nov. 9, 1903).

Distrib. Maudshuria, Mongolia, China, and Corea.

Suaeda maritima (Linn.) Dumort.; Moq. in Ann. Sc. Nat. 1^{re} Sér. XXIII. p. 308, et Chenop. Enum. p. 127; Fenzl in Ledeb. Fl. Ross. III. p. 786; C. Koch in Linnæa XXII. p. 189; Bunge in Act. Hort. Petrop. VI. p. 429, et XIII. p. 21; Benth. Fl. Austral. V. p. 206; Hook. fil. Fl. Brit. Ind. V. p. 14; Forbes et Hems. in Journ. Linn. Soc. XXVI. p. 329; Makino in Bot. Mag., Tokyo, VIII. (1894). p. 382.

Chenopodium maritimum Linn. Cod. n. 1814; Willd. Sp. Pl. I. p. 1307; Pers. Syn. Pl. I. p. 295; Schult. Syst. Veg. VI. p. 272; Spreng. Syst. Veg. I. p. 922; Lindl. Syn. Brit. Fl. ed. 2, p. 216.

Chenopodiina maritima Moq. in DC. Prodr. XIII. 2, p. 161; Debeaux Fl. Shangh. n. 97, Fl. Tchef. n. 164, et Fl. Tients. n. 56.

Schoberia maritima C. A. Mey. in Ledeb. Fl. Alt. I. p. 400; Bunge Enum. Pl. Chin. Bor. p. 56; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 520; Maxim. Ind. Fl. Pek. in Prim. Fl. Amur. p. 476.

Salsola maritima Bieb.; Poir. Encycl. VII. p. 291.

Nom. Jap. *Hama-matsuna* (*T. Makino*).

Hab. Prov. MUSASHI: Hiranuma in Yokohama (*T. Makino* ! Sept. 3, and 16, 1894); Prov. IDZUMI: Ishitsu near Sakai, in muddy sands by seashore (*T. Makino* ! Nov. 14, 1895); Prov. SUŌ: Toishi-hama in Tokuyama-mura (*D. Nikai* ! herb. Sc. Coll. Imp. Univ. Tokyo, Oct. 1897).

Salicornia herbacea Linn. Sp. Pl. ed. 2, p. 5; Richt. Cod. n. 24; Willd. Sp. Pl. I. p. 23; Pers. Syn. Pl. I. p. 5; Roem. et Schult. Syst. Veg. I. p. 38, Mant. p. 54, Add. II. p. 103; Spreng. Syst. Veg. I. p. 18 (excl. syn. nonnul.); Hook. Fl. Bor. Amer. II. p. 125; Ledeb. Fl. Alt. I. p. 2; Fenzl in Ledeb. Fl. Ross. III. p. 767; Moq. Chenopod. Enum. p. 114, et in DC. Prodr. XIII. 2, p. 144; Reichb. Fl. Germ. Excurs. p. 576; Maxim.

Prim. Fl. Amur. p. 227, et Suppl. Ind. Fl. Mongol. p. 484; Bunge in Mém. Biol. X. p. 287, et in Act. Hort. Petrop. VI. p. 421 et XIII. p. 21; Fr. Schmidt Reis. im Amur. u. Ins. Sachal. p. 166; Herd. Pl. Radd. Apetal. in Act. Hort. Petrop. X. p. 617; Lindl. Syn. Brit. Fl. ed. 2, p. 214; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 521; A. Gray Man. Bot. ed. 5, p. 410; Benth. Handb. Brit. Fl. ed. 5, 372; Hook. fil. Stud. Fl. Brit. Isl. ed. 3, p. 341; Brit. et Br. Ill. Fl. N. Un. St. et Can. I. p. 352, fig. 1389; Palib. Consp. Fl. Kor. II. p. 33.

Salicornia europæa var. *herbacea* Linn. Sp. Pl. p. 3.

Salicornia acetaria Pall.

Salicornia herbacea a. *acetaria* Moq. Chenop. Enum. p. 114, et in DC. Prodr. XIII. 2. p. 144; C. Koch in Linnæa XXII. p. 187; Syme Engl. Bot. ed. 3, VIII. p. 6, tab. 1181.

Nom. Jap. *Akkeshi-sō* (K. Miyabe).

Hab. Prov. KUSHIRO in Hokkaidō: Kaki-zima in Akkeshi (*K. Sugi-yama!* 1891).

Rare. The Japanese one belongs to *S. herbacea* a. *acetaria* Moq. My specimens are due to the kindness of Prof. Dr. K. Miyabe.

Beta vulgaris Linn. β . **maritima** (Linn.) C. Koch in Linnæa XXII. (1849) p. 180.

Beta maritima Linn. Sp. Pl. ed. 2, p. 322; Richt. Cod. n. 1818; Schult. f. Syst. Veg. VI. p. 298; Ledeb. Fl. Ross. III. p. 692; Reichb. Fl. Germ. Excurs. p. 580; Syme Engl. Bot. ed. 3, VIII. p. 8, tab. 1184; Lindl. Syn. Brit. Fl. ed. 2, p. 216; Koch Syn. Fl. Germ. et Helv. ed. 3, p. 526; Bisset et S. Moore in Journ. Bot. (1877) p. 297; Franch. et Sav. Enum. Pl. Jap. II. p. 654.

Beta vulgaris a. *pilosa* et β . *maritima* Moq. Chenop. Enum. p. 14, et in DC. Prodr. XIII. 2, p. 56.

Nom. Jap. *Hama-fudansō* (T. Makino).

Hab. Prov. MUSASHI: Hiranuma in Yokohama (*T. Makino!* Aug. 26 1888).

Very rare.

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OBSERVATIONS ON THE FLORA OF JAPAN.

Fasciculus 4.

1904.

By

T. Makino,

*Assistant in the Botanical Institute, Science College,
Imperial University of Tokyo.*

Reprinted from the BOTANICAL MAGAZINE, Tokyo, Vol. XVIII. 1904.

TOKYO

1904.

Observations on the Flora of Japan.*

Fasciculus IV. 1904.

By

T. Makino,

Assistant in the Botanical Institute, Science
College, Imperial University of Tokyo.

Natsiatum sinense Oliv. in Hook. Ic. Pl. XIX. (1889), tab. 1900 ;
Diels Fl. Centr.-Chin. in Engler's Bot. Jahrb. XXIX. (1901), p. 447 ;
Bretschn. Hist. Eur. Bot. Disc. Chin. p. 780.

Natsiatum japonicum Makino in Bot. Mag., Tokyo, VII. (1893) p.
119.

Deciduous scandent shrub. Branches slender, dextorse, laxly ramulose, avellaneous-griseous, glabrate, but disparsedly adpressed-hirsute or densely tomentoso-hirsute in young shoot, distributed with small lenticels; scars of leaves slightly prominent and orbicular, with a flat face; leaf-bud naked (without bud-scales), tomentose with isabel-coloured hairs. Leaves alternate, long-petiolate, exstipulate, ovate or elliptical-ovate, cordate at base, acuminate, coarsely repand-dentate with apiculate tip, disparsedly piloso-hirsute on both surfaces (hairs denser beneath), 5-12 cm. long, 3-9 cm. broad, membranaceous, green above, paler beneath; midrib prominent beneath; lateral veins 5-6 on each side; erect-patent, hardly arcuate, reaching the tip of teeth of the margin; main veinlets transverse between lateral veins, the small veinlets delicate and numerously anastomosing; petiole slender, attaining about 8 cm. long, disparsedly adpressed-hirsute. Panicle in the axil of leaves and fallen leaves, laxly ramoso into slender filiform pedicels which are much longer than flowers, cernuo-pendulous, 2-6-flowered, attaining about 8 cm. in length, disparsedly adpressed-pilose. Flower (staminate) regular, 9-12 mm. across. Calyx much smaller than corolla, deeply 5-parted, 3 mm. or little more across, patent, carnosulate, green, densely covered with antrorsely adpressed fulvous hirsute hairs externally, glabrous internally; lobes deltoid-ovate, obtuse. Corolla carnosulata, viridescent, 5-petaled, valvate in bud, coherent into a broad campanulate glabrous tube at the base; lobes patent, oblong-lanceolate, attenuatedly acuminate

* BOTANICAL MAGAZINE, Tokyo, Vol. XVIII. (1904).

and uncinulato-reflexed at the apex, $6\frac{1}{2}$ –7 mm. long, $2\frac{2}{3}$ –3 mm. wide, entire, 1-nerved, lateral veins loose delicate and obscure, dispersedly strigillose with fulvous hairs externally, reticulately deep-green-nerved and minutely papillose internally. Stamens 5, alternate to petals, free, erect, longer than the corolla-tube, equal, 3 mm. long; filament straight, stout, thick, slightly narrowed towards both ends, green; anther short, elliptical, introrse but then reflexed turning outwards, 2-celled, dorsifixed, golden-yellow. Scales 5, alternate to stamens and closely placed at the base of them, minute, carnosulate, deltoid, obtuse-angled, truncate at the top, yellowish-viridescent. Pistil 1, shorter than stamens, erect; ovary ellipsoid-ovoid, viridescent, very thinly dispersed with antrorsely adpressed setulose colourless hairs, 1-celled, with 2 pendulous ovules; style terminal, stout, erect, straight, a little longer than ovary; stigma funnel-shaped and 4-lobed. Fruiting panicle attaining about 4 cm. in length, laxly with fruits; pedicel shorter than the fruit. Fruit oblong-elliptical, compressed, with persistent calyx, scarlet when mature, reticulated-veined when dried, 12–17 mm. long, crustaceous, 1-seeded. Seed oblong-elliptical, compressed, with thin coat, albuminous; cotyledons large, foliaceous; caulicle small.

Hab. Prov. TOSA: Mt. Kurotaki (*T. Makino!* Nov. 1892); Prov. IYO: Mt. Ishidzuchi (*K. Okudaira!* Aug. 1893; *S. Yamaguchi!* June 25, 1896; *M. Shirai!* August 1896), North-eastern foot of Mt. Ishidzuchi (*K. Okudaira!* June 25, 1897), Near Shirai-Fall in Kawanouchi, Miuchi-mura (*K. Okudaira!* May 7, 1899).

This is found in mountain woods of south-western Japan. The genus is new to Japan and a representative of *Icacinaceæ* in this country.

FAURIA Franch. (1886).—*Nephrophyllidium* Gilg (1895).—*Villarsia* sp. Griseb.—*Menyanthes* sp. Menz. (GENTIANACEÆ.)

Fauria Crista galli (Menz.) Makino.

Fauria japonica Franch. in Bull. Soc. Philomath. Paris (8 mai 1886) p. 3; Engler in Engler et Prantl Nat. Pfl.-Fam. III. 2 (1891) p. 62.

Menyanthes Crista galli Menzies in Hook. Bot. Miscel. I. (1830) p. 45, tab. 24; A. Gray Syn. Fl. N. Am. II. 1, p. 128.

Villarsia Crista galli Griseb. Gen. et Sp. Gent. (1839) p. 338, et in DC. Prodr. IX. (1845) p. 136; Hook. Fl. Bor. Am. II. p. 70; Ledeb. Fl. Ross. III. p. 76; Miq. Prol. Fl. Jap. p. 289; Herd. Pl. Radd. IV. 1, p. 193; Franch. et Sav. Enum. Pl. Jap. I. p. 325.

Nephrophyllidium Crista galli Gilg in Engler et Prantl Nat. Pfl.-Fam. IV. 2 (1895) p. 105, fig. 47; Yabe in Bot. Mag., Tokyo, XVII. p. 25.

Nom. Jap. *Iwa-ichō* (Rock Ginkgo).

Hab. Middle and Northern Japan, alpine mountains.

Gentiana (Chondrophylla) **pseudo-humilis** Makino, sp. nov.

Biennial, attaining about 5 cm. in height in flower, quite glabrous. Roots slender, narrow, filiform, ramose. Stem erect, pauci- to subnumerous-ramose, fleshy, nearly immersed among leaves, with short internodes; branches uniflorous. Leaves closely placed, carnosulate, green, narrowly pellucid-membranaceous on the margin, which is scabrous in lower leaves, sharply carinate dorsally often with scabrous edge, connato-vaginate at the base, trinerved, with loosely anastomosing veinlets above; lower leaves orbiculate or subspathulato-orbiculate or elliptical and patulose but obovato-spathulate or oblong in ascendant ones, cuspidate, 6-13 mm. long, 2-7 mm. wide, basal ones rosulate; superior leaves adpressed, 5-9 mm. long, subulato-lanceolate, or subulato-linear, cuspidato-acute, conduplicate. Flower sessile or shortly pedicellate, 13-14 mm. long. Calyx tubuloso-campanulate, viridescent, 5-carinato-angular, narrowed below, about 8 mm. long, 15-nerved below and loosely anastomosing veined above, narrowly pellucid-membranaceous in valleys; teeth erect, adpressed, slightly shorter than one-half as long as the tube, deltoid-subulate, acuminato-acute, carinate on the back, pellucid-margined, short and truncate in the edge between teeth. Corolla $1\frac{1}{2}$ as long as calyx, tubuloso-infundibuliform, narrowed below, virido-cærulescent above; limb much shorter than the tube, broadly deltoid-ovate or ovato-orbiculate, cuspidato-acute, entire; plaits thinly membranaceous, about $\frac{1}{2}$ as long as the limb, lato-deltoid, 2-fid, irregularly pauci- or pluri-denticulate above. Stamens included; filament subulato-filiform; anther elliptical or elliptical-oblong. Ovary shortly and broadly stipitate, narrowly oblong; style deeply 2-fid, the main portion very short, arms revolute and papilloso-pubescent.

Nom. Jap. *Hina-rindō* (nov.).

Hab. Prov. SHINANO: Mt. Yatsugadake (*H. Takeda* and *S. Kawada*! July 27, 1903).

Rare. Very closely allied to *Gentiana humilis* Stev., which have oblong-lanceolate and subconnato-vaginate cauline leaves, ovato-lanceolate

calyx-teeth, ovate corolla-lobes, and lato-rounded and subentire or dentate plaits; possibly a variety of the latter species.

Aspidium (*Polystichum*) **lachenense** Hook. Sp. Fil. IV. p. 8, tab. 212; Hook. et Baker Syn. Fil. p. 250; Clarke Rev. Fern. N. Ind. in Trans. Linn. Soc. 2nd. Ser. I. p. 506; Bar. et Christ in Nuov. Giorn. Bot. Ital. N. Ser. IV. (1897) p. 10.

Polystichum lachenense Bedd. Ferns Brit. Ind. tab. 32, et Handb. Ferns Brit. Ind. p. 203; Diels in Engl. et Prantl Nat. Pfl.-Eam. 1. 4, p. 191, et Fl. Centr.-Chin. in Engler's Bot. Jahrb. XXIX. p. 192.

A small fern, attaining 18 cm. in height. Rhizome short, oblique, densely covered with castaneous ovate acuminate sub-dentate scales. Stipe erect, very densely tufted forming a compact mass with numerous old ones which are accompanied by a few or several marcescent rachises free from fallen pinnae, $2\frac{1}{2}$ -5 cm. long, castaneous below, scaly. Frond longer than the stipe, linear-lanceolate, simply pinnate, sub-coriaceous, 6-11 cm. long, $1\frac{1}{3}$ -2 cm. wide; rachis slender, viridescens, apterous, dispersed with subulato-linear pale-fulvous spinuloso-denticulate thin scales; pinnae numerous, patent, rather distant, sessile, green, dispersedly scaly beneath, more or less reduced in size in lower ones, deltoid-ovate, rather obtuse with a subspinulose point, slightly oblique and rounded-subtruncate at the base, attaining 10 mm. long, 7 mm. broad, crenato-serrate with sub-spinulose point but sub-pinnatifid below, the lowest lobe pauci-serrulate with sub-spinulose points; midrib subflexuous; veins erect-patent, furcate, lower ones pinnate with simple venules. Sori dorsal, 2-serial, 1-12 to a pinna, situated in the midway between the midrib and margin but slightly nearer the midrib; indusium thinly membranaceous, pale, peltate, irregularly crenulato-subdentate.

Nom. Jap. *Takane-shida* (nov.).

Hab. Prov. SHINANO: Mt. Yatsugatake (*H. Takeda*! July 27, 1903).

Rare. New to the Flora of Japan.

Distrib. Eastern Himalaya, and Central China.

Cacalia palmata (Thunb.) Makino.

Arnica palmata Thunb. Fl. Jap. (1784) p. 319; Willd. Sp. Pl. III. (1800) p. 2112; Pers. Syn. Pl. II. (1807) p. 454; Spreng. Syst. Veg. III. (1826) p. 567.

Senecio palmatus Less. Syn. Gen. Comp. (1832) p. 392; DC. Prodr. VI. p. 733; Palib. Consp. Fl. Kor. I. p. 118, non Pall. nec Lapeyr.

Syneilesis palmata Maxim. in Mém. Biol. IX. p. 300 (1874).

Senecio Syneilesis Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 249; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 449; Yatabe in Bot. Mag., Tokyo, VII. p. 245, tab. 9.

Cacalia Syneilesis Matsum. Shokubutsu-Mei-I (1895) p. 57.

Cacalia aconitifolia Miq. Prol. Fl. Jap. pp. 113, 361, 366, non Bunge.

Nom. Jap. *Taimin-gasa*.

Hab. Mountain woods in Middle and Southern Japan.

Erigeron dubius (Thunb.) Makino, non Spreng.

Inula dubia Thunb. Fl. Jap. (1784) p. 318; Willd. Sp. Pl. III. (1800) p. 2100; Pers. Syn. Pl. II. (1807) p. 451; Spreng. Syst. Veg. III. (1826) p. 521.

Aster japonicus Less. Syn. Gen. Comp. (1832) p. 182, et in DC. Prodr. V. p. 228; Nees Gen. et Sp. Aster. (1833) p. 34; A. Gray in Perry's Exped. Jap. II. p. 314; Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 3, p. 181.

Erigeron Thunbergii A. Gray Bot. Jap. (1859) p. 395, cum *var. ? glabratum*; Miq. Prol. Fl. Jap. pp. 102, 362; Franch. et Sav. Enum. Pl. Jap. I. p. 227.

Erigeron pulchellus ? A. Gray in Perry's Exped. Jap. II. p. 314, ex Miq. l. c. p. 102, non DC.

Nom. Jap. *Adzuma-giku*.

Hab. Middle Japan.

Pieris (Portula) **nana** (Maxim.) Makino in Bot. Mag., Tokyo, VIII. (1894) p. 213.

Andromeda nana Maxim. in Mém. Biol. VIII. p. 615 (1872); Franch. et Sav. Enum. Pl. Jap. I. p. 284; et II. p. 526; H. de Boiss. in Bull. Herb. Boiss. V. (1897) p. 912.

Nom. Jap. *Hama-zakura*, *Komeba-tsugazakura*.

Hab. Middle and Northern Japan, alpine summit of mountains.

Oxycoccus japonicus (Miq.) Makino.

Vaccinium japonicum Miq. in Ann. Mus. Bot. Lugd.-Bat. I. (1863-64) p. 28, II. p. 160, et Prol. Fl. Jap. p. 92; Maxim. in Mél. Biol. VIII. p. 604; Franch. et Sav. Enum. Pl. Jap. I. p. 280; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 16; Diels in Engler's Bot. Jahrb. XXIX. p. 516; H. de Boiss. Bull. Herb. Boiss. V. (1897) p. 905.

Nom. Jap. *Aku-shiba*.

Hab. Japan, widely distributed.

Chiogenes hispidula Torr. et Gray var. **japonica** (A. Gray) Makino.

Chiogenes japonica A. Gray Syn. Fl. N. Am. II. 1. p. 26, in nota.

Chiogenes hispidula Miq. Prol. Fl. Jap. p. 94; Maxim. in Mél. Biol. VIII. p. 609; Franch. et Sav. Enum. Pl. Jap. I. p. 282, non Torr. et Gray.

Nom. Jap. *Harigane-kadzura*.

Hab. Mountain woods in Middle Japan.

Eurya emarginata (Thunb.) Makino.

Ilex emarginata Thunb. Fl. Jap. (1784) p. 78; Willd. Sp. Pl. I. (1797) p. 710; Pers. Syn. Pl. I. (1805) p. 151; Rœm. et Schult. Syst. Veg. III. (1818) p. 491; Spreng. Syst. Veg. I. (1825) p. 495; DC. Prodr. II. (1825) p. 16; Miq. Catal. Mus. Bot. Lugd.-Bat., Fl. Jap. p. 19; Maxim. Cor. II. et Monochasm. p. 53.

Eurya chinensis R. Br. in 'Abel's Voy. Append. (1818) p. 379, cum ic.'; DC. Prodr. I. p. 525; Blume Mus. Bot. Lugd.-Bat. II. p. 108; Seem. Bot. Voy. 'Herald.' p. 366; Miq. Prol. Fl. Jap. p. 203; Dyer in Hook. fil. Fl. Brit. Ind. I. p. 285; Kanitz Anthoph. Jap. p. 25; Franch. et Sav. Enum. Pl. Jap. I. p. 58; Maxim. in Engler's Bot. Jahrb. VI. p. 60; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 76; Ito et Matsum. Tent. Fl. Lutch. I. p. 59; Diels in Engler's Bot. Jahrb. XXIX. p. 474.

Eurya littoralis Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 2, p. 163, n. 199; Hoffm. et Schult. Noms Indig. Pl. Jap. in Journ. Asiat. (1852) p. 293, n. 231; Zoll. Syst. Verz. Ind. Archip. p. 143.

Eurya parvifolia Gardn. (1847).

Eurya japonica *δ. parvifolia* Thw.

Nom. Jap. *Hama-hisakuki*.

Hab. Southern Japan, near sea.

Ribes (*Ribesia*, *Rubra*) **laxiflorum** Pursh Fl. Am. Sept. II. p. 731 ; Schult. Syst. Veg. V. p. 499 ; Spreng. Syst. Veg. I. p. 810 ; Torr. et Gray Fl. N. Am. I. p. 550 ; A. Gray Bot. Jap. p. 388 ; Maxim. in Mém. Biol. IX. p. 227 ; H. de Boiss. in Bull. Herb. Boiss. V. (1897) p. 693.

Ribes affine Dougl. ex 'Bong. Veg. Sitcha in Mém. Acad. Pétersb. II. (1833) p. 138' ; Fr. Schmidt Reis. in Amur. u. Ins. Sachal. p. 132 (*var. sachalinensis*).

Ribes prostratum β . Hook. Fl. Bor. Amer. I. p. 232.

Nom. Jap. *Toga-suguri* (K. Miyabe).

Hab. Prov. KUSHIRO in Hokkaido: Senpōji (*K. Miyabe!* July 2, 1884) ; Prov. SHINANO: Mt. Tateshina (*T. Furukawa!* Aug. 19, 1898), Mt. Yatsugatake (*K. Tanaka!* August 1902).

New to Honsiu.

Trachycarpus excelsus (Thunb.) Wendl.

a. typicus.

Trachycarpus excelsus Wendl. ex C. Gay in Bull. Soc. Bot. France VIII. (1861) p. 429 ; Henry in Trans. Asiat. Soc. Jap. XXIV. Suppl. p. 99 ; Diels in Engler's Bot. Jahrb. XXIX. p. 233.

Trachycarpus excelsus Beccari et Hook. fil. in Hook. fil. Fl. Brit. Ind. VI. p. 436 ; C. H. Wright in Journ. Linn. Soc. XXXVI. p. 168, ex parte.

Chamærops excelsa Thunb. Fl. Jap. (1784) p. 130, excl. *var. β .* ; Pers. Syn. Pl. I. p. 400, excl. syn. ; Mart. 'Nat. Hist. Palm. III. p. 251, tab. 125' ; Kunth Enum. Pl. III. p. 250 ; Walp. Ann. V. p. 818 ; Miq. Prol. Fl. Jap. p. 329 ; Franch. et Sav. Enum. Pl. Jap. II. p. 1 ; Kanitz Anthoph. Jap. p. 10.

Rhapis flabelliformis Willd. Sp. Pl. IV. p. 1093 ; Spreng. Syst. Veg. II. p. 137 ; Schult. Syst. Veg. VII. p. 1490, ex parte, non Ait.

Sjuro et *Sodio* Kæmpf. Amcen. Exot. p. 898.

Nom. Jap. *Shuro*.

Hab. Middle and Southern Japan, planted.

β . **Fortunei** (Hook.) Makino.

Chamærops Fortunei Hook. in Bot. Mag. tab. 5221 ; Debeaux Fl. Shangh. n. 119, excl. syn. ; Bretschn. Hist. Eur. Bot. Disc. Chin. pp. 511, 843.

Trachycarpus Fortunei Wendl. ex C. Gay in Bull. Soc. Bot. France VIII. p. 429; Diels in Engler's Bot. Jahrb. XXIX. p. 233.

Trachycarpus excelsus Beccari et Hook. fil. in Hook. fil. Fl. Brit. Ind. VI. p. 436; C. H. Wright in Journ. Linn. Soc. XXXVI. p. 168, ex parte.

Nom. Jap. *Tō-shuro* (Chinese *Trachycarpus*).

Hab. Middle and Southern Japan, cultivated from China.

Philydrum lanuginosum Banks in Geertn. Fruct. et Semin. Pl. I. (1788) p. 62, tab. 16, fig. 10; Lam. Ill. Gen. I. (1791) p. 12, tab. 4; Poir. Enc. Méth. Bot. V. (1804) p. 269; Willd. Sp. Pl. I. (1797) p. 17, et Enum. Pl. Hort. Bot. Berol. (1809) p. 6; Bot. Mag. (1804) tab. 783; Pers. Syn. Pl. I. (1805) p. 4; R. Br. Prodr. Fl. Nov. Holl. I. p. 256; Ait. Hort. Kew. ed. 2, I. p. 9; Rœm. et Schult. Syst. Veg. I. (1817) p. 38; Schult. Mant. Syst. Veg. I. (1822) p. 54; Spreng. Syst. Veg. I. (1825) p. 18; Rosc. in Trans. Linn. Soc. VIII. p. 342, tab. 20, fig. 5; Kunth Enum. Pl. III. p. 380; Schnizl. Ic. Fam. Nat. tab. 52; Griff. Notul. Pl. Asiat. III. p. 231, et Icon. Pl. Asiat. tab. 269-70; Steud. Syn. Glum. II. p. 314; Miq. Fl. Ind. Bat. III. p. 250; Benth. Fl. Hongk. p. 380, et Fl. Austral. VII. p. 74; Hassk. in Bull. Bot. Soc. France XVI. (1869) p. XXIV; Hance in Journ. Bot. IX. (1871) p. 202; Caruel in A. DC. Monogr. Phan. III. p. 3; Hook. fil. Fl. Brit. Ind. VI. p. 363; Bretschn. Hist. Eur. Bot. Disc. Chin. pp. 200, 204; N. E. Brown in Journ. Linn. Soc. XXXVI. p. 150.

Garciana cochinchinensis Lour. Fl. Cochinch. p. 15, ed. Willd. p. 20. Nom. Jap. *Tanuki-ayame* (Y. Tashiro).

Hab. Prov. SATSUMA in Kiusiu: Agune (*S. Ikeno!* Aug. 15, 1897; *T. Kawakami!* Oct. 1901); Loochoo: Isl. Okinawa (*Y. Tashiro!* herb. Soc. Coll. Imp. Univ. Tokyo, Aug. 1887; *H. Kuroiwa!*); Yaeyama (*Y. Tashiro!* herb. *ibid.* Aug. 1887).

In the southern part of Kiusiu, it is rarely found, at first collected by Professor S. Ikeno. In 1882, Mr. Y. Tashiro collected it in Tanega-shima, an island placed near the southern extremity of Kiusiu.

Campanumœa (Cyclocodon) **truncata** (Wall.) Diels Fl. Centr.-Chin. in Engler's Bot. Jahrb. XXIX. (1901) p. 606.

Codonopsis truncata Wall. 'Cat. n. 1301'; A. DC. 'Monogr. Camp. p. 122,' et Prodr. VII. p. 423.

Cyclocodon truncatus Hook. fil. et Thoms. in Journ. Linn. Soc. II. p. 18.

Campanumcea celebica Clarke in Hook. fil. Fl. Brit. Ind. III. p. 436, pro parte, non Blume, excl. syn. nonnul.

Campanumcea axillaris Oliv. in Hook. Ic. Pl. XVIII. tab. 1775, (1888); Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 7; Henry in Trans. Asiat. Soc. Jap. XXVI. Suppl. p. 570.

? *Cyclocodon adnatus* Griff. Notul. Pl. Asiat. IV. p. 278.

Stem and branches subquadangular. Leaves lato-lanceolate, attaining 12 cm. long, 5 cm. or more broad. Bracteoles sometimes leafy, rarely adnate to the base of the fruit. Fruit subdepressed-globose, about $1\frac{1}{2}$ cm. across. Seed minute, numerous, oval, compressed, smooth, umber-coloured.

Nom. Jap. *Tangebu* (in Amami Ōshima).

Hab. FORMOSA: Tamsui (*Morse*); LOOCHOO: Amami Ōshima (*Y. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 1887), Naze in Amami Ōshima (*T. Uchiyama!* herb. *ibid.* Dec. 4. 1900), Yaeyama Archip. (*Y. Tashiro!* herb. *ibid.* Aug. 1887).

New to the Loochoo Flora.

Cremastra unguiculata Finet in Bull. Soc. Bot. France XLVII. (1900) p. 269.

Oreorchis unguiculata Finet l. c. XLIII. (1896) p. 698, tab. 14, et XLIV. (1897) p. 70.

A terrestrial Orchid. Roots fibrous, slender, filiform, whitish, densely hairy, issuing and spreading from the base of the pseudobulb in the verticillate manner. Rhizome short, wiry, glabrous, ascending, with a pseudobulb at the top. Pseudobulb erect, tuberous, ovoid or globoso-ovoid, about 12–15 mm. long, 7–15 mm. across, smooth, with 2 nodes, loosely covered with marcescent fibres of old vaginæ. Leaves 2, situated at the apical end of the pseudobulb, broadly lanceolate or oblong-lanceolate, 11–17 cm. long including the petiole, 2–3 $\frac{1}{3}$ cm. broad, entire, sharply acute at the apex, gradually attenuated below into a narrow petiole, subplicate, glabrous, thinly chartaceous, maculate with purple spots beneath; triplinnerved, with numerous and close small veinlets between main nerves; transverse venules delicate and loose; petiole slender, 3–5 cm. long, canaliculate in front, the outer one forming a tubular sheath below and enclosing

that of the inner leaf. Scape erect from the superior part under the apical end of the pseudbulb, much longer than leaves, slender, terete, smooth, $3\frac{1}{2}$ – $4\frac{1}{2}$ decim. high including the raceme, $2\frac{1}{2}$ –3 mm. in diameter in the lower portion, a basal sheath with marcescent fibres in flowering time, furnished with distantly placed 2 sheaths in the lower portion; sheath long, tubular, $3\frac{1}{2}$ –5 cm. long, close to the scape, glabrous, scarioso-membranaceous, longitudinally and loosely nerved, mouth oblique, acutish-obtuse at the apex. Raceme erect, about 10–15 cm. long, shorter than scape, loosely about 7–10-flowered; rachis slender, straight, glabrous, angular; bracts small, much shorter than ovary, one for each flower, erect-patent, lanceolate, attenuated above and obtuse at apex, entire, scarioso-membranaceous, trinerved, 4–8 mm. long, $2\frac{1}{2}$ – $2\frac{2}{3}$ mm. broad. Flowers middle-sized, ascending. Perianth half-patent, brownish-yellow. Sepals linear-spathulate, long and narrowly attenuated below, shortly tapering towards the apex with an obtuse tip, entire, 3–5-nerved, moderately thin, glabrous; dorsal one 2– $2\frac{1}{3}$ cm. long, $2\frac{4}{5}$ – $3\frac{1}{3}$ mm. wide; lateral ones scarcely shorter and scarcely narrower than the dorsal one, hardly falcate. Petals shorter and narrower than the sepals, 18–20 mm. long, 2– $2\frac{1}{2}$ mm. wide, linear-spathulate, very slightly curved, narrowly and gradually attenuated below, subacute, entire, thin on margin, blotched with purple spots, 3-nerved, the outer nerves often furcate above. Labellum white, long-unguiculate, ecalcarate; lamina dilated, subpendulous, thin, glabrous, about $6\frac{1}{2}$ –8 mm. long, $5\frac{1}{2}$ –7 mm. broad, contracted and geniculate with the unguis at the base, tripartite, furnished with a tubercle at the base; tubercle minute, about $1\frac{1}{3}$ mm. long, vertically oblong, rugose, rounded-obtuse at the posterior end and subacute and gradually elevated towards the anterior end; mid-lobe largest, rhombeo-panduliform, the lower half broadly cuneate with nearly entire margins, the upper half semi-orbicular or broadly ovate, minutely crisped and erose on the margin, hardly emarginate with a mucronate tip in centre; nerves 5, lateral ones branching above and disappearing before reaching the margin; lateral lobes much smaller, erect-patent, linear-ligulate, $2\frac{1}{2}$ –4 mm. long, $\frac{1}{2}$ – $\frac{2}{3}$ mm. broad, straight or scarcely curved inwards, often somewhat dilated at the base, obtuse, entire, 1-nerved; unguis straight, longer than the lamina, slightly shorter than the gynostemium and nearly parallel to it, 9–10 mm. long, very shortly adherent to both lateral edges of the base of the gynostemium with the basal both margins, slender, lato-linear, entire-margined, involute, with a longitudinal ridge internally and a longitudinal groove externally; nerves parallel, 5 in the middle portion, the outer one furcate above and the outer

branch running to the lateral lobes of the lamina. Gynostemium slightly coherent to the base of petals at the base, 11–14 mm. long, slightly arcuate, nearly erect, subterete, narrowly elongate, apterous, somewhat clavate above, smooth, shallowly canaliculate in front; clinandrium flat, scarcely triangular-subsemiorbicular, bordered with elevated and slightly crispate margin except in front, with a longitudinal prominent ridge in centre; anther terminal, operculate, semi-orbicular, compressed, membranaceous, unilocular with 2 small laminae within; pollinia 4, in 2 pairs, sessile, waxy, yellow, each mass compressed, obovate, plano-convex, gland submembranaceous, lunato-hippocrepiform; stigma situated immediately under the clinandrium, nearly rounded-obovate, concave, bordered, covering the upper side by the lower oblique margins of the clinandrium, the lower lateral borders open and nearly winged. Ovary filiform, shorter than the perianth, longitudinally ribbed, very slightly enlarged above, glabrous, 10–15 mm. long including the short twisted pedicel. Capsule (immature) cylindrical, enlarged above, shortly pedicellate.

Hab. Prov. ISHIKARI in Hokkaidō (Ezo): Tsukisappu (*T. Kawakami!* June 22, 1894, June 1897); Prov. IWASHIRO: Miharu (*K. Nemoto!* June 1903); Prov. MINO (after *Yokusai Inuma* and *Keisuke Itō*); Prov. ŌMI: Mt. Ibuki, *forma immaculata* (after *K. Itō*).

The above description is based on Ezo specimens kindly sent me by Mr. Takiya Kawakami, and specimens from prov. Iwashiro, which are due to the kindness of Mr. Kwanzi Nemoto. This species is not common in Japan; besides Ezo it grows in mountains of the middle part of this country. It has the general appearance of *Oreorchis*, but pollinia are quite different.

Cremastra appendiculata (D. Don) Makino.

Cymbidium appendiculata D. Don Prodr. Fl. Nepal. (1826) p. 36; Spreng. Syst. Veg. III. (1826) p. 725.

Cremastra Wallichiana Lindl. in 'Wall. Cat. no. 7349,' Gen. et Sp. Orchid. Pl. p. 173 (1833), et in Journ. Linn. Soc. III. (1859) p. 30; Miq. Prol. Fl. Jap. p. 136; Franch. et Sav. Enum. Pl. Jap. II. p. 24; Finet in Bull. Soc. Bot. France XLVII. (1900) p. 269.

Hyacinthorchis variabilis Blume 'Cent. Plant. Nov. (1829) 4,' et Mus. Bot. Lugd.-Bat. I. p. 48, fig. 16 (1849); Walp. Ann. III. p. 548.

Cremastra mitrata A. Gray Bot. Jap. in Mem. Amer. Acad. N. Ser. VI. (1858–59) p. 411.

Nom. Jap. *Saihai-ran*.

Hab. Japan, widely distributed.

Damnacanthus indicus Gært. fil. *a. genuinus* Makino in Bot. Mag., Tokyo, XI. (1897) p. 279.

Damnacanthus indicus Gært. f. Fruct. et Semin. Pl. III. (1805) p. 18, tab. 182, fig. 7; DC. Prodr. IV. p. 473; Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 3, p. 176; A. Gray in Perry's Exped. Jap. II. p. 314; Miq. Prol. Fl. Jap. p. 274; Franch. et Sav. Enum. Pl. Jap. I. p. 210; S. Moore in Journ. Bot. (1875) p. 231; Hook. fil. Fl. Brit. Ind. III. p. 158; Maxim. in Mém. Biol. XI. p. 795; Engl. et Maxim. in Engler's Bot. Jahrb. VI. p. 67; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 386; K. Schum. in Engl. et Prantl Nat. Pfl.-Fam. IV. 4, p. 137; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 39; Matsum. in Bot. Mag., Tokyo, XV. (1901) p. 14; Pritzl in Diels Fl. Centr.-Chin. in Engler's Bot. Jahrb. XXIX. p. 583 (1901).

Carissa spinarum Thunb. Fl. Jap. p. 108, non Linn.

Baumannia geminiflora DC. in 'Mém. Soc. Phys. Genève. IV. (1833) cum icon.'

So no ki, aliis *Fira* et *Firasi* Kæmpf. Amœn. Exot. p. 784.

Many-branched. Leaves very shortly petioled, ovate, elliptico-ovate, or oval-ovate, sharply acute, rounded or rounded-obtuse at the base, attaining $2\frac{3}{8}$ cm. long, $1\frac{1}{2}$ cm. wide, coriaceous; veins 2-3 on each side; spines attaining 2cm. in length, shorter or longer than or equal to leaves. Flowers very shortly pedicellate, 13-17 mm. long, 10-11 mm. across. Calyx-lobes deltoid-lanceolate, narrowly deltoid, or deltoid, acuminate. Corolla-lobes ovate or deltoid-ovate, acute. Stigmatic lacinae linear, or lato-linear, obtuse.

Nom. Jap. *Aridōshi*, *kotori-tomarazu*, *nezumisashi*, *nezumi-no-hana-tōshi*.

Hab. Middle and Southern Japan, found growing in wooded places.

forma microphyllus Makino.

Damnacanthus indicus var. *microphyllus* Makino in Bot. Mag., Tokyo, VI. (1892) p. 55, et XI. (1897) p. 279.

Densely branched. Leaves dense, very shortly petioled, ovate, narrowly ovate, or orbicular-ovate, sharply acute, rounded or rounded-obtuse at base, coriaceous, 5-13 mm. long, 4-8 mm. wide; spine often longer than leaves. Flowers 9-14 mm. long, very shortly pedicellate. Calyx-lobes lato-deltoid,

acuminate. Corolla-lobes elliptico-ovate, or deltoid-ovate, acutish or sub-obtuse. Stigmatic lacinæ linear-oblong, obtuse.

Nom. Jap. *Hime-aridōshi*.

Hab. Prov. TOSA: Hakawa (*T. Makino!* 1885), Ochi (*T. Makino!* May 6, 1889), Godaisan in kōchi (*T. Makino!* 1892); AMAMI ŌSHIMA: Honcha-tōge (*T. Uchiyama!* herb. Sc. Coll. Imp. Univ. Tokyo, Dec. 11, 1900).

β. major (Sieb. et Zucc.) Makino in Bot. Mag., Tokyo, XI. (1897) p. 279.

Damnacanthus major Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 3, p. 177; Walp. Ann. I. p. 984; Regel Gartenfl. (1868) p. 35; Miq. Prol. Fl. Jap. p. 274; Franch. et Sav. Enum. Pl. Jap. I. p. 211; Maxim. in Mél. Biol. XI. p. 796; K. Schum. in Engl. et Prantl Nat. Pfl.-Fam. IV. 4, p. 137, fig. 44 C, D.

Leaves ovate or elliptical-ovate, sharply acute, rounded or rounded-obtuse at base, coriaceous, about $1\frac{1}{2}$ –4 cm. long, $1\frac{1}{8}$ – $2\frac{1}{2}$ cm. broad; veins about 3–5 on each side; petiole 2–3 mm. long; spine minute, or attaining 12 mm. long, much shorter than leaves. Flower shortly pedicellate, about $1\frac{1}{2}$ cm. long, 1 cm. across. Calyx-lobes deltoid, acute or acuminate. Corolla-lobes ovato-deltoid, acutish. Stigmatic lacinæ oblong-linear, obtuse. Berry about 1 cm. across.

Nom. Jap. *Zyuzune-no-ki*.

Hab. Prov. KII: Mt. Nachi (Herb. ! Sc. Coll. Imp. Univ. Tokyo, July 19, 1883); Prov. SHIMA: Obama-mura (*Z. Umemura!* May 1892); Prov. OWARI: Taketoyo (*T. Makino!* Oct. 31, 1893); Prov. SUŌ: Ōuchi-mura (*D. Nikai!* herb. ibid. Nov. 6, 1901); Prov. TOSA: Mt. Soyemimizu (*T. Makino!* Oct. 5, 1885), Iyoki (*T. Makino!* Dec. 3, 1892).

forma macrophyllus (Sieb.) Makino.

Damnacanthus macrophyllus Sieb. herb. ex Miq. Prol. Fl. Jap. p. 274; Franch. et Sav. Enum. Pl. Jap. I. p. 211.

Damnacanthus major var. *macrophyllus* Maxim. in Mél. Biol. XI. p. 796.

Damnacanthus major var. **β. submitis** Maxim. ex Regel Gartenfl. (1868) p. 35, tab. 570; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 607.

Damnacanthus indicus var. *major* Matsum. in sched. herb. Sc. Coll. Imp. Univ. Tokyo, et in Bot. Mag., Tokyo, XV. (1901) p. 15, excl. syn.

Leaves elliptical-ovate, oblong-ovate, or oblong-lanceolate, shortly acuminate, rounded or rounded-obtuse and often oblique at base, coriaceous, 3– $6\frac{1}{2}$ cm. long, $1\frac{1}{3}$ –3 cm. wide; veins 5–7 on each side; petiole 2– $3\frac{1}{2}$ mm. long; spine minute or deficient. Flower shortly pedicellate, $1\frac{1}{2}$ cm. long.

Calyx-lobes deltoid-ovate, shortly acuminate. Corolla-lobes deltoid-ovate, obtuse. Stigmatic lacinæ linear-oblong, obtuse. Berry about 8 mm. across.

Nom. Jap. *Ōba-no-aridōshi* (in sched. herb. Sc. Coll. Imp. Univ. Tokyo), *Ōba-zyuzune-no-ki*.

Hab. Prov. MUSASHI: Tokyo, Koishikawa Bot. Gard., cult. (Herb. Sc. Coll. Imp. Univ. Tokyo, May 7, 1879, Oct. 27, 1882); Prov. TOSA: Kamibun (*T. Makino!* Dec. 1891).

γ. **giganteus** Makino var. nov.

Damnacanthus indicus var. *macrophyllus* Makino in Bot. Mag., Tokyo, XI. (1897) p. 279; Matsum. in sched. herb. Sc. Coll. Imp. Univ. Tokyo, et in Bot. Mag., Tokyo, XV. (1901) p. 15, excl. syn.

Damnacanthus major var. *macrophyllus* Makino in sched. herb. Sc. Coll. Imp. Univ. Tokyo, non Maxim.

Loosely branched. Leaves shortly petioled, lanceolate or lato-lanceolate, sometimes subfalcate, gradually long-acuminate, cuneato-acute at the base, entire and scarcely repand, coriaceous-membranaceous, glabrous, green above, paler beneath, attaining 13 cm. in length, $3\frac{1}{3}$ cm. in width; midrib prominent beneath; veins 6-9 on each side, erect-patent and arcuate upwards; petiole 4-7 mm. long; spine very minute or none. Flowers very shortly pedicellate, 12-15 mm. long. Calyx-lobes lato-deltoid, submucronato-acute. Corolla-lobes deltoid. Anther narrowly oblong. Stigmatic lacinæ narrowly oblong, obtuse. Ovary (as is the calyx) thinly dispersed with minute pilosulate hairs. Berry (immature) about 5 mm. across, very shortly pedicellate.

Nom. Jap. *Nagaba-zyuzunenoki* (nov.).

Hab. Prov. TOSA: Nanokawa (*T. Makino!* 1885; *K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, May 4, 1888).

This differs from *var. major forma macrophylla* (= *D. macrophyllus* Sieb.) by the larger longer and much more acuminate thinner leaves which are acute at the base, more numerous lateral veins, and broader calyx-lobes. It is found in the southern parts of this country.

δ. **lancifolius** Makino var. nov.

Leaves lanceolate, sharply acuminate, cuneato-acute at base, crispulate on margin, thinly coriaceous, attaining $5\frac{2}{3}$ cm. long, $1\frac{2}{3}$ cm. broad; veins 5-7 on each side; petiole $1\frac{1}{2}$ -3 mm. long; spine attaining about $1\frac{1}{2}$ cm. in length. Flower very shortly pedicellate. Calyx-lobes deltoid, acuminato-acute.

Nom. Jap. *Hosoba-zyuzunenoki* (nov.).

Icon. Inuma's Sōmoku-Dzusetsu, Arbor. ined. II. n. 24, sub nom. *Kotori-tomarazu* (コトリトマラズ).

Hab. Prov. ISE: Udzi (*Z. Umemura!* April 16, 1893); Prov. MIKAWA: Mt. Mitsugamine-yama in Hadzu-gōri (*G. Nagura!* Sept. 20, 1896).

This differs from *γ. giganteus*, by the much smaller leaves and well developed spines, and at first it was figured by Y. Inuma in his work as cited above. It is found in the middle parts of Japan.

Stephania japonica (Thunb.) Miers 'Contrib. Bot. III. p. 213'; Kanitz Anthoph. Jap. (1878) p. 26; O. Kuntze Rev. Gen. Pl. I. (1891) p. 9.

Menispermum japonicus Thunb. Fl. Jap. (1784) p. 193; Lam. Encycl. Méth. III. (1789) p. 96; Willd. Sp. Pl. IV. (1805) p. 827; Pers. Syn. Pl. II. (1807) p. 627; Spreng. Syst. Veg. II. (1825) p. 154.

Cocculus japonicus DC. Syst. I. (1818) p. 516, et Prodr. I. (1824) p. 96; Sieb. et Zucc. Fl. Jap. Fam. Nat. in Abhandl. Akad. Muench. IV. 2 (1843) p. 189, n. 360.

Cissampelos hernandifolia Willd. Sp. Pl. IV. (1805) p. 861; DC. Syst. I. (1818) p. 533, et Prodr. I. (1824) p. 100; Spreng. Syst. Veg. III. (1826) p. 910; Roxb. Fl. Ind. III. (1832) p. 842.

Clypea hernandifolia Wight et Arn. Prodr. Fl. Pen. Ind. Or. I. (1834) p. 14; Wight Ic. Pl. Ind. Or. III. tab. 939.

Stephania hernandifolia Walp. Repert. I. (1842) p. 96; Hook. f. et Thoms. Fl. Ind. I. (1855) p. 196; Miq. Fl. Ind. Bat. I. 2 (1859) p. 83; Miers 'Contrib. Bot. III. p. 222'; A. Gray Bot. Jap. in Mem. Am. Acad. N. Ser. VI. (1859) p. 380; Benth. Fl. Hongk. (1861) p. 13, et Fl. Austral. I. (1863) p. 57; Miq. Prol. Fl. Jap. (1866-67) p. 198; Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 20; Hook. f. et Thoms. in Hook. f. Fl. Brit. Ind. I. (1875) p. 103; Maxim. in Mém. Biol. XI. p. 643, tab. 2, figg. 1-9 (1883); Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 29 (1886); Henry in Trans. Asiat. Soc. Jap., Suppl. p. 16; Bretsch. Hist. Eur. Bot. Disc. Chin. (1898) p. 603; Diels in Engler's Bot. Jahrb. XXIX. (1901) p. 345.

Cissampelos discolor DC. Syst. I. (1818) p. 534, et Prodr. I. (1828) p. 101.

Clypea discolor Blume Bijdr. Fl. Nederl. Ind. p. 26 (1825).

Stephania discolor Spreng. Syst. Veg. IV. Cur. Post. (1827) p. 316; Walp. Repert. I. (1842) p. 96; Hassk. Pl. Jav. Rar. (1848) p. 168; Hemsl. Fl. Lord Howe Isl. in Ann. Bot. X. (1896) p. 231; Ito et Matsum. Tent. Fl. Lutch. I. (1899) p. 21.

Stephania rotunda Miq. Catal. Mus. Bot. Lugd.-Bot., Fl. Jap. (1870) p. 4; Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 20, non Loureiro.

Clypea longa G. Don 'Gen. Syst. I. p. 113.'

Cissampelos hexandra Roxb. 'Hort. Beng. (1814) p. 74,' et Fl. Ind. III. (1832) p. 841.

Stephania hypoglauca Miers 'Contrib. Bot. III. p. 227.'

Stephania intertexta Miers l. c. p. 224.

Stephania latifolia Miers l. c. p. 224.

Clypea consummata Miers l. c. p. 209.

Clypea subovata Miers l. c. p. 209.

Nom. Jap. *Hasunoha-kadzura*.

Hab. Southern Japan.

***Mussænda shikokiana* Makino sp. nov.**

Mussænda parviflora Miq. var. *shikokiana* in sched. herb.

Branchlet subquadrangular-terete, brownish-fulvous, dispersed with adpressed pilose hairs above. Leaves petiolate, oval-elliptical, suddenly short-acuminate, rounded and decurrent to the upper portion of the petiole at the base, entire, membranaceous, very thinly dispersed with pilose hairs and hairs denser on the nerves above, piloso-pubescent on nerves beneath, green above, paler beneath, 10–11 cm. long, 6–7 cm. wide; midrib prominent beneath; veins 7–10 on each side, erect-patent, arcuate upwards, reaching the margin, regularly arranged; petiole 1–2 cm. long, thinly adpressed-pilose. Fruiting cyme about 10 cm. across, divaricately branched, pubescent. Fruits many, globoso-obovoid, 10–11mm. long, 9–10mm. across, thinly adpressed-pilose, with a ring remained by the fallen calyx and corolla, nigrescent when dry, pedicellat; pedicel shorter than the fruit. Seeds numerous, minute, oval-elliptical, compressed, yellowish-brown, scrobiculate.

Hab. Prov. Tosa: Shimonokaye in Hata-gōri (*K. Watanabe!* Aug. 24, 1892).

Though I do not yet seen flowers, leaves and seeds differ from those of *Mussænda parviflora* Miquel.

***Plectranthus inflexus* Vahl var. *verticillatus* Makino in Bot. Mag., Tokyo, VI. (1892) p. 54.**

Leaves 4-verticillate, ovate, crenate; petiole winged by the decurrence of the blade. Flower as in the type.

Hab. Prov. SAGAMI: Tsukui (*Y. Muraoka!* October 1888).

Nodes of the stem are very remote from each other in my specimen.

Scutellaria shikokiana Makino in Bot. Mag., Tokyo, VI. (1892) p. 54.

Scutellaria sp. Makino l. c. III. (1889) p. 4.

Perennial, stoloniferous; stolons long, filiform, hypogeous, nodes remote from each other and provided with minute scales; roots delicate. Stem erect, 5-28cm. long including the raceme, simple or ramose, gracile, tetragonous, glabrous, green. Leaves opposite, long-petiolate, ovato-deltoid, with an obtuse point at the apex, truncate or truncato-subcordate at base, but sometimes about right-angled in the superior ones, coarsely inciso-dentate with obtuse deltoid teeth, herbaceo-membranaceous, very thinly dispersed with pilose hairs above, glabrous and sometimes purplish beneath, deep green, 1-5cm. long, 1-4cm. broad; veins loose; petiole attaining 3cm. in length, glabrous. Raceme erect, laxly several-many-flowered, 1-6cm. long, bracteate; rachis gracile, tetragonous, very thinly pilose, green; bracts lanceolate or ovato-lanceolate, very shortly petiolate or sessile, longer than pedicels, entire, very thinly pilose, green, inferior ones often leafy and dentate, superior ones gradually decreasing in size, the smallest one slightly exceeding the pedicel. Flower pedicellate, small, 5-10mm. long, white; pedicel shorter than flowers, erect-patent, pilosulate, $1\frac{1}{2}$ -4mm. long, green. Calyx $1\frac{1}{2}$ -2mm. long, campanulate, green, patently and thinly glanduloso-pubescent externally, shallowly bilabiate with entire lobes, in fruit enlarged to 3mm. in length and depressed and close; appendage lato-orbicular, thinly glanduloso-pubescent in front and glanduloso-ciliated, concavo-convex, green, enlarged to 3mm. in width in fruit. Corolla ascending; tube tubular, a little curved at the base, more or less enlarged above, finely glanduloso-puberulent externally and thinly pilose internally; limb bilabiate, much shorter than the tube, the upper lip small, erect, short, emarginato-bilobed, the lower lip much larger and longer, 3-lobed, minutely spotted, lateral lobes erect, smaller and slightly shorter than the upper lip, ovato-deltoid, obtuse, the midlobe nearly pendulose, ample, longer than lateral lobes, again 3-lobulate, lateral lobules subquadrangular-oval, patulous, the midlobule much wider and longer, emarginate. Stamens 4, didynamous, inserted below the middle of the corolla-tube, the longer ones equal to the upper lip in height;

filament filiform, softly puberulent below; anther short and broad, minutely dense-ciliated on margins of anther-cells, the upper ones lato-cordate. Style nearly equal to stamens in height, filiform, glabrous, curved under the stigma; stigma sub-bilobed, the upper lobe shorter. Ovary-lobes globoso-obovoid, borne on a thick disk. Nutlets 1 mm. and a little more across, slightly depressed, rounded at the top, muricate all over, black.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* 1885, Aug. 28, 1887, 1889), Nanokawa (*T. Makino!* Nov. 1884), Mt. Kurotaki (*K. Watanabe!* Aug. 10, 1888); Prov. IYO: Nametoko (*Z. Umemura!* July 12, 1894), Shiroy-no-taki (*Z. Umemura!* Aug. 17, 1897); Prov. MUSASHI: Mt. Takao (*T. Makino!* July 16, 1890), Mt. Bukō (*N. Kayeyiyama!* July 29, 1896).

Scutellaria indica Linn. var. **japonica** (Morr. et Decne.) Franch. et Sav. **forma humilis** Makino in Bot. Mag., Tokyo, X. (1896) p. 314.

Dwarf. Stems often caespitose, erect, with short internodes. Leaves long-petiolate, patent, bicolorous, green above, violaceous beneath. Flowers often dense.

Hab. Prov. TOSA: Hōgashō in Aki-gōri (*T. Makino!* June 3, 1892).

Solanum glaucum Dunal in DC. Prodr. XIII. 1 (1852) p. 100; Makino in Bot. Mag., Tokyo, XIII. p. 366.

This was at first about fifty years ago introduced to Nagasaki in Kiusiu and therefrom spread over warmer parts of this country.

Callicarpa shikokiana Makino in Bot. Mag., Tokyo, VI. (1892) p. 54.

A small tree; branchlet slender, pulvereo-pubescent with curved short minute hairs, mixed with minute granular glands. Leaves opposite, shortly petiolate, elliptical-lanceolate, caudately long-acuminate, attenuately cuneate towards the base, coarsely dentate with acute deltoid or depressed-deltoid teeth or obtuse ovato-deltoid teeth excepting the upper and lower portions which are entire, 4–13 cm. long, 2–4 cm. broad, membranaceous, thinly dispersed with pubescent hairs and minute granular glands on both surfaces, and hairs denser on the midrib and lateral veins; midrib prominent beneath; lateral veins 5–6 on each side, ascending, reaching the teeth;

petiole pubescent, 5–8mm. long. Cyme supra-axillary, rather densely many-flowered, peduncled, shorter than leaves but much exceeding the petiole, divaricately branched, 2–3½ cm. across; peduncle erect-patent or patent or slightly reflexed, 12–18 mm. long, straight, pubescent and covered with minute granular glands as are branches of the cyme; bracts minute, linear or lato-linear, thinly pubescent externally. Flowers small, 3 mm. across, white, shortly pedicellate, dispersed with minute granular glands. Calyx 1 mm. long, broadly obconico-campanulate, 4-nerved, shallowly 4-toothed, teeth depressed-deltoid, acutish. Corolla exceeding the calyx, shortly campanulate-infundibuliform, 4-lobed, about 2½ mm. long; lobes patent, orbicular, shorter than the tube. Stamens 4, much exerted; filament filiform, glabrous, 4 mm. long; anther elliptical, 2-auriculate at the base, with granular glands on back. Style filiform, glabrous, scarcely longer than the stamen; stigma shortly obconical and truncate. Ovary minute, included within the calyx, globose, with granular glands. Berry numerous, 2 mm. across, purple. Flowers in July-August.

Hab. Prov. Tosa: Iburi (*T. Makino!* Oct. 25, 1885), Mt. Imano in Hata-gōri (*T. Makino!* Aug. 7, 1889).

Rhododendron (*Azaleastrum*) **ellipticum** Maxim. in *Mél. Biol.* XII. p. 742 (1888); Forbes et Hemsl. in *Journ. Linn. Soc.* XXVI. p. 22; Tashiro in *Bot. Mag., Tokyo*, III. (1889) p. 201; Bretschn. *Hist. Eur. Bot. Disc. Chin.* p. 620, in nota.

A small tree, attaining about 4–8 m. in height and about 1 decim. in diameter of the trunk (after Y. Tashiro), 2–3- or sometimes 4–5-chotomously ramose, glabrous; branchlet terete, usually pale-fulvous or pale-brownish. Leaves persistent during three years, coriaceous, falsely 4–7-verticillate towards the top of branchlets and at nodes, patent, petiolate, oblong-elliptical or narrowly oblong, suddenly mucronato-acute at the apex, cuneato-acute at the base, entire, sub-shining, nearly concolorous, 5–12 cm. long, 1½–4½ cm. broad, with impressed nerves above; veins patulous, loose, inconspicuous; petiole 1–2cm. long; leaf-buds conico-linear, 2–6-aggregate at the top of branchlets, about 1½cm. long, imbricately perulate. Flowers 1–2 at the top of branchlets, long-pedicellate, large, about 6 cm. in diameter, pale-rose; pedicel 2–2½cm. long; perulæ imbricate, chartaceo-membranaceous, the internal ones much larger, pale-pubescent-tomentose above internally, the lower ones ample and spatulato-obovate, involute, the upper ones longer and angustato-linear, often exceeding the pedicel. Calyx depressed-

cupuliform, the margin more or less uneven. Corolla rotato-infundibuliform, dotted at the superior side within below; the tube rather short; segments obovato-oblong, longer than the tube. Stamens 10, included, unequal in length; filament filiform, paleaceo-tomentose below excepting the very base; anther elliptical. Style longer than stamens, slender, arcuate upwards, obconical towards the stigma; stigma truncate, 5-lobed; ovary linear-cylindrical, glabrous, 5-locular, about 11mm. long. Capsule narrowly cylindrical, 5-sulcate, about 3 cm. long. Flowers in April-May.

Hab. YAEYAMA ARCHIP. (*Y. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, April 1886, flower), Ōkawa-mura in Isl. Ishikaki (*Setsusaburō Tanaka!* herb. ibid. June 1891, fruit); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. under the name of *Seishi-kwa* (*T. Makino!* Feb. 1904).

Distrib. Southern China.

Rhododendron (*Azalea*) **Weyrichii** Maxim. *Rhod. As. Orient.* p. 26, tab. 2, figg. 1-6; Franch. et Sav. *Enum. Pl. Jap. I.* p. 288; Forbes et Hemsl. in *Journ. Linn. Soc. XXVI.* p. 32; Bretsch. *Hist. Eur. Bot. Disc. Chin.* p. 619.

Azalea Weyrichii O. Kuntze *Rev. Gen. Pl. II.* p. 387.

Rhododendron Farrerae a. Weyrichii Diels in Engler's *Bot. Jahrb. XXIX.* p. 513.

Rhododendron shikokianum Makino in *Bot. Mag., Tokyo, VI.* (1892) p. 53.

A shrub, attaining about 3m. or more in height, many-branched. Branchlets often verticillate, ferrugineo-rufous. Branchlets of floriferous branches bear usually 3 (!) or rarely 2 leaves at the top; the binate one is due to the imperfection of the inner leaf, and the 3-nate one is the normal state; branchlets of sterile branches bear 3 leaves at the top. Flower-bud terminal, rather large, about 19 mm. long, 9 mm. across, conico-ovoid; perulæ imbricate, ferrugineous, oval-ovate to elliptical, rounded or rounded-obtuse with a cuspidato-mucronate point, fulvo-villoso-tomentose on margin. Corolla red. Leaves rhombeo-oval, or rhombeo-ovate, mucronato-acute, very thinly dispersed with pale-fulvous villose hairs above, thinly villosopubescent beneath, attaining about 8 cm. long, 7 cm. broad in fruit; petiole 6-11 mm. long. Capsule conico-cylindrical, adpressed-villosopubescent, about 17 mm. long.

Hab. Prov. Tosa in Shikoku: Sakawa (*T. Makino!*), Kōchi (*T.*

Makino!), Kamibun (*T. Makino!*); Prov. Higo: Mt. Some-dake in Isl. Amakusa (*M. Murakami!*).

This species is common in the province of Tosa, where it flowers abundantly after *Rh. rhombicum* Miq.; it grows on hills and low mountains.

Ranunculus (Hecatonia) **Kawakamii** Makino sp. nov.

Ranunculus Cymbalariae herb. Sc. Coll. Imp. Univ. Tokyo, non Pursh.

Ranunculus sp. Kawakami in Bot. Mag., Tokyo, XI. p. 56; Makino l. c. XIII. p. 321.

Perennial, glabrous, flagelliferous, 4-12 cm. in height; runners few, repent, long, filiform, radican, with remote nodes; roots fasciculato-fibrous. Leaves radical, few-13-tufted, erect, long-petiolate, ovate-elliptical, elliptical, elliptical-oblong, or oblong, obtuse or obtuse-subtruncate at the base, coarsely 3- rarely 5-dentate with depressed and obtuse teeth (the middle tooth larger), entire on lateral margins, 7-16 mm. long, 5-10 mm. broad, flaccid-herbaceous, membranaceous when dried; main nerves 3; petiole slender, much longer than the blade, $1\frac{1}{2}$ - $7\frac{1}{2}$ cm. long, narrowly vaginate at the base. Scape aphyllous, erect, slender, exceeding the leaves, simple or with one branch above the middle; bract situated in the middle portion of scapes or at the base of the branch, small, subulate or linear, shortly vaginate at the base. Flower about 8mm. across, terminal, yellow. Sepals 5, patent, not reflexed, elliptical or ovato-elliptical, obtuse or rounded-obtuse, concave, thin, glabrous, deciduous, usually 3-nerved, viridescent, about 3 mm. long. Petals 5, patent, longer than the sepal, oblong, manifestly cuneately unguiculate, rounded at the apex, $3\frac{1}{2}$ -4mm. long, nerves trichotomously divided at the point of the nectary; nectary situated between the limb and claw, minute, the scale short and truncate, both lateral margins connected to the petal. Stamens numerous, equal to sepals in length; filament linear-filiform; anther short and depressed-ovate. Ovaries numerous forming a globose head, compressed, oblong-sublunate, straight at the inner edge, acute at the apex and minutely beaked into a short straight or slightly curved style, nearly 1mm. long including the style. Follicles numerous, aggregated into a globose head ($4\frac{1}{2}$ mm. across), small, compressed, obliquely cuneato-obovate, about $1\frac{2}{3}$ mm. long, viridescent, longitudinally several-ribbed, minutely beaked with the straight style, the inner edge nearly straight; gynophore obovoid-globose, very thinly hairy, 1 mm. and more in length.

Hab. Prov. UGO; Fuku-ura (*T. Kawakami!* 1897), Mt. Chōkai (*T. Kawakami!* 1897); Prov. RIKUZEN: Takata-machi in Kesen-gōri (*G. Toba!* Sept. 15, 1903); Prov. KADZUSA; Motosuka (*Y. Wakana!* July 28, 1902); Prov. IWAKI: Niida (*K. Okada!* herb. Sc. Coll. Imp. Univ. Tokyo, June 21, 1901).

This grows on muddy situation near sea in Northern Japan and found at first by Mr. Takiya Kawakami, who kindly sent me the specimens and figures for examination. In form it very closely resembles *Ranunculus plantaginifolius* Murr. (= *R. suluginosus* DC. non Pall.), but it is smaller and leaves are quite glabrous and thinner; in the form of leaves it differs apparently also from *R. Cymbalariae* Pursh (= *R. suluginosus* Pall.), which is not yet found in Japan. Runner sometimes issuing from the axil of the bract on the scape.

Eranthis pinnatifida Maxim. in *Mél. Biol.* IX. p. 605, in nota, tab. IX. figg. 3-8 (1876); Franch. et Sav. *Enum. Pl. Jap.* II. p. 269; Huth in Engler's *Bot. Jahrb.* XVI. p. 299.

? *Eranthis Keiskei* Franch. et Sav. l. c. p. 269; Huth l. c. p. 297.

? *Helleboroides albiflorum* Huth.

A small perennial herb, about 8-10 cm. high in flower, but attaining about 18 cm. in height in fruit. Corm globose, solid, brown externally, attaining 2 cm. in diameter, provided with delicate fibrous roots below, and with scapes and radical leaves above. Leaves all radical, green, often slightly purpurascens on margin and paler on veins as are the involucre bracts in flower, 1-6 to a rhizome, shorter than the scape, long-petiolate, glabrous, flaccid, deeply 3-parted, orbiculato-reniform and somewhat 5-angulate in outline, attaining about 7 cm. in length and in width in fruit, but smaller in flowering time; each lobe pectinately pinnati-parted into lato-linear acutish segments; the midlobe ovate and cuneate at the base; lateral lobes again deeply 2-parted, sometimes sub-3-parted, very broadly cuneate at the base. Scapes 1-6 to a rhizome, erect or ascending, slender, glabrous, flaccid; involucre bracts 2, opposite, sessile, patent, foliaceous, glabrous, deeply 3-parted, the midlobe simple and lato-linear or paucilacinate, the lateral lobes paucilacinate at the base or laciniato-pinnate into oblong-linear segments. Flower solitary, pedicellate, erect or nearly so, white, about 16-17 mm. across; pedicel puberulent, shorter or longer than the flower. Sepals 5, petaloid, nearly patent, membranaceous, veined,

elliptical-ovate, uneven-margined, deciduous, 10–12 mm. long, 7 mm. broad. Petals 5–8, nectariform, much shorter than sepals, 4 mm. long, stipitate, furcate into erect-patent spathulate lobes resembling the form of Y signature, white but yellow at the upper end, secreting honey juice from the cavity in the axil, deciduous. Stamens 10–20, erect-patent, shorter than sepals, slightly unequal in length, 6–7 mm. long; filaments filiform, glabrous; anther oval-ovate, rounded-obtuse at the apex, purpurascens, 2-celled, introrse, with white pollen, the anther-wall darkish-cærulescent after bursting. Ovaries 2–5, erect, very shortly stipitate, angustato-oblong, compressed, greenish, nearly glabrous, about 5 mm. long including the style, 6–8-ovuled; ovules globoso-obovoid; style terminal, erect, shorter than the ovary, compressed, broad; stigma terminal, narrowly lunate along the apical margin of the style. Follicles 2–5, shortly stipitate, patent, oblong, compressed, about 10 mm. long, 5 mm. broad, beaked with a persistent small style; carpel thinly coriaceous, glabrous, veins obliquely transverse. Seed globose, yellowish-brown, echinulato-scaberulose, about 4 mm. across. Flowers in March-April.

Hab. Prov. MUSASHI: Chichibu (*R. Yatabe* and *J. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, April 24, 1878), Kawachi in Chichibu (*T. Makino*! April 2, 1895), Yokose in Chichibu (*T. Makino*! April 1895), Mt. Tsumasaka-tōge (*T. Makino*! April 1895; *B. Hayata*! herb. ibid. April 1903).

Clematis (*Cheiroopsis*) **tosaensis** Makino in Bot. Mag., Tokyo, VI. (1892) p. 50, et XI (1897) p. 332.

Stem and leaves as in *C. japonica* Thunb. Pedicel shorter than leaves, 1–2 cm. long, hirsute-pubescent, ebracteate. Flower nutant, 2–nearly 3 cm. long, ochroleucous. Sepals campanulate, hirsute-pubescent externally and hairs slightly denser towards the margin, spathulato-oblong, rounded-obtuse, thin, crispate and membranaceous on margins, glabrous internally; main nerves 3, with loosely anastomosing veinlets above. Stamens onehalf as long as the sepal, filament linear, pilosulate; anther narrower and much shorter than the filament. Pistil shorter than stamens, about 9–20; ovule slightly villose dorsally; style densely villose. Achene narrowly ovate, attenuated above, glabrous, about 6 mm. long; tail 2 cm. long, villose.

Hab. Prov. TOSA: Mt. Torigata (*T. Makino*! May 22, 1889), Mt. Kuishi in Tadzikawa-mura (*T. Makino*! May 6, 1893); Prov. YAMASHIRO:

Mt. Hiei (*C. Takemura!* May 12, 1901); Prov. ISE: Mt. Asama (*Z. Umemura!* May 7, 1893), Ōishi-mura (*Z. Umemura!* April 28, 1895); Prov. RIKUZEN: Kaga (*Kameziriō Yendō!* June 10, 1900); Prov. SHINANO (*K. Tanaka!* 1900); Prov. SURUGA: Mt. Fuzi (*S. Matsuda!* July 1891).

***Clematis* (Cheiropsis) *japonica* Thunb. var. *brevipedicellata* Makino var. nov.**

Pedice! 2-4 cm. long, ebracteate, villosulate. Flower as in the type, but pale-greenish. Sepals thickish, obtuse, pubescent but lanato-tomentose on margins externally, pubescent internally.

Hab. Prov. SHIMOTSUKE: Nikkō (*T. Makino!* June 9, 1901).

In the type of *C. japonica* Thunb., pedicels are elongate and equal to or longer than the leaves, bracteate above the middle, with the purple and tubuloso-campanulate flower.

***Gynura japonica* (Thunb.) Makino.**

Senecio japonicus Thunb. Fl. Jap. (1784) p. 315; Willd. Sp. Pl. III. (1800) p. 1978; Pers. Syn. Pl. II. p. 433; Ait. Hort. Kew. ed. 2, V. p. 38; Spreng. Syst. Veg. III. p. 565.

Kleinia japonica Less. in Linnea VI. (1831) p. 134, et Syn. Gen. Compos. (1832) p. 196.

Porophyllum japonicum DC. Prodr. V. (1836) p. 650; Sieb. et Zucc. Fl. Jap. I. p. 161, tab. 84, et in Abhandl. Akad. Muench. IV. 3, p. 185; A. Gray Bot. Jap. p. 395.

Gynura pinnatifida DC. Prodr. VI. p. 301; Miq. Prol. Fl. Jap. p. 111; Franch. et Sav. Enum. Pl. Jap. I. p. 245; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 448; Diels in Engler's Bot. Jahrb. XXIX. p. 619.

Cacalia pinnatifida Lour. Fl. Cochinch. p. 593 (ed. Willd.).

? *Gynura Zollingeriana* Schultz-Bip. in Zoll. Syst. Verz. Ind. Archip. p. 126, nomen.

Nom. Jap. *Sanshichi*.

Hab. Japan, cultivated.

***Ligularia tussilaginea* (Burm.) Makino.**

Arnica tussilaginea Burm. Fl. Ind. (1768) p. 182; Spreng. Syst. Veg. III. p. 568.

Senecio tussilaginea O. Kuntze Rev. Gen. Pl. I. p. 364.

Tussilago japonica Linn. Syst. Veg. II. p. 629, et Mant. Pl. I. (1767) p. 113; Richt. Cod. n. 6264; Hoult. Nat. Hist. XXVIII. (1779) p. 634, tab. 68, fig. 2; Thunb. Fl. Jap. (1784) p. 313; Banks Icon. Kæmpf. tab. 27, 28; Willd. Sp. Pl. III. (1800) p. 1968; Poir. Encycl. Méth. VIII. p. 152; Pers. Syn. Pl. II. (1807) p. 455; Sieb. Syn. Pl. Oecon. Jap. in Verb. Batav. Gen. XII. (1830) p. 59.

Senecio japonicus Less. Syn. Gen. Compos. p. 392.

Senecio Kämpferi DC. Prodr. VI. (1837) p. 363; Maxim. in Mém. Biol. VIII. p. 14; Franch. et Sav. Enum. Pl. Jap. I. p. 247; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 425; Henry List Pl. Formos. p. 55.

Ligularia Kämpferi Sieb. et Zucc. Fl. Jap. I. (1835) p. 77, tab. 35, et in Abhandl. Akad. Muench. IV. 3, p. 188; Miq. Prol. Fl. Jap. p. 112; Bot. Mag. tab. 5302 (*var. aureomaculata*); Bretsch. Hist. Eur. Bot. Disc. Chin. p. 44; Diels in Engler's Bot. Jahrb. XXIX. p. 622.

Farfugium Kämpferi Benth. Fl. Hongk. p. 191.

Ligularia gigantea Sieb. et Zucc. Fl. Jap. I. p. 79, tab. 36, et in Abhandl. Akad. Muench. IV. 3, p. 188.

Farfugium grande Lindl. in Gardn. Chron. (1857) p. 4, et (1860) p. 170.

Tussilago cucullata Sieb. herb. ex Miq. Prol. Fl. Jap. p. 112.

Senecio Sieboldii Schultz-Bip. in Zoll. Syst. Verz. Ind. Archip. p. 126.

Senecio Farfugium C. Koch 'Wochenschrift für Gärtnerei (1858) I. p. 209.'

Tswa Kämpf. Amœn. Exot. (1712) p. 827.

Nom. Jap. *Tsuwa-buki*.

Hab. Japan, grows near sea, and also cultivated.

Myroxylon japonicum (Thunb.) Makino.

Apactis japonica Thunb. Fl. Jap. (1784) p. 191; Willd. Sp. Pl. II. (1799) p. 845; Pers. Syn. Pl. II. (1807) p. 2; Spreng. Syst. Veg. II. (1825) p. 460.

Hisingera japonica Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 2 (1846), p. 168.

Xylosma japonicum A. Gray Bot. Jap. in Mem. Am. Acad. N. Ser. VI. (1856) p. 381; Hance in Journ. Bot. (1870) p. 275, et (1878) p. 8.

Hisingera racemosa Sieb. et Zucc. Fl. Jap. I. (1835) p. 169, tab. 88, et p. 189, tab. 100 III. figg. 1-14.

Xylosma racemosa Miq. Ann. Mus. Bot. Lugd.-Batav. II. (1865-66) p. 155, et Prol. Fl. Jap. (1866-67) p. 87; Franch. et Sav. Enum. Pl. Jap. I. p. 43; K. Ito et H. Kaku Fig. et Descr. Pl. Koishik. Bot. Gard. II. tab. 11; Maxim. in Engler's Bot. Jahrb. VI. p. 58; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 57; Maxim. Pl. Chin. Potan. p. 63; Palib. Consp. Fl. Kor. I. p. 36.

Myroxylon racemosum O. Kuntze Rev. Gen. Pl. I. (1891) p. 44.

Flacourtia chinensis Clos in Ann. Sc. Nat. 4 sér. VIII. (1857) p. 219; Walp. Ann. VII. p. 228; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 434.

Son no Ige Thunb. Fl. Jap., Pl. Obsc. p. 355.

Nom. Jap. *Kusudoige*.

Hab. Southern Japan.

Cyperus (Choristachys, Compressi) **japonicus** Makino sp. nov.

? *Cyperus amuricus* Maxim. var. *japonica* Miq. Prol. Fl. Jap. p. 73.

Annual, attaining about 56 cm. in height, glabrous. Roots fibrous, densely fasciculate, purpurascens. Leaves basal, 3-4, shorter than or equal to the culm, linear, gramineous, long-acuminate, carinato-plane, flaccid, green, scabrous on the upper margin, 3-7 mm. broad, long-sheathing at the base. Culm erect, about 2-5-caespitose, slender, trigonous with glabrous edges, smooth, green. Umbel with 4-9 rays, loose, 4-16 cm. across; rays erect-patent, unequal in length, the interior one sessile; peduncles slender, strict, compressed, the longest one about 11 cm. long, basal sheath 4-13 mm. long, truncate; involucre 3-4, long, leafy, the outer ones much exceeding the rays, the longest one about 26 cm. Spikes often 2 to 6 or solitary to a ray, many-spiculose, 1-2 cm. across, lateral ones sessile and patently radiate and shorter than the terminal one; rachis slender, angulate, glabrous; bracts few, setaceo-subulate or setaceo-linear, usually shorter than the spike. Spiculæ subcapitato-racemosely and rather densely disposed, erect-patent or patulose, linear, 5-15 mm. long, 2 mm. broad, compressed, subaxly and distichously 8-23-flowered, yellowish-auranticous; rachilla compressed, distinctly narrow-winged, glabrous. Glume $1\frac{2}{3}$ mm. long, erect-patent, orbicular, rounded and cuspidate at the apex (the cuspidate point

erect and not long), entire, carinato-navicular, glabrous, with 5-nerves towards the centre, often reddish-ferruginous near and between the nerves, viridescent at the back, membranaceous and aurantico-yellowish on sides. Stamens 2, slightly exerted; filament filiform; anther oblong, $\frac{1}{3}$ mm. long. Style minute, very short; arms 3, delicate, filiform, longer than the style. Caryopsis slightly shorter than the glume, $1\frac{1}{3}$ mm. long, oblong, slightly narrowed below, trigonous, dark-brown, very minutely scabro-punctate, obtuse and minutely beaked with the remaining style at the apex.

Hab. Japan, widely distributed and common.

Intermediate species among *Cyperus Iria* Linn. and *C. amuricus* Maxim, closely approaching the latter one.

Bulbostylis capillaris Kunth var. **capitata** (Miq.) Makino in Bot. Mag., Tokyo, IX. (1895) p. 390.

Isolepis capillaris β . *capitata* Miq. Prol. Fl. Jap. p. 75; Franch. et Sav. Enum. Pl. Jap. II. p. 116.

Hab. Prov. TOSA: Sakawa (*T. Makino!* 1884, Sept. 21, 1887), Iburi (*T. Makino!* Oct. 25, 1885), Saga (*T. Makino!* Oct. 22, 1885), Near Yokobatake (*T. Makino!* Aug. 1885), Kawaguchi (*K. Watanabe!* Oct. 1891); Prov. ŌMI: Near Uyeno-nura (*T. Makino!* Nov. 1893).

Iris sibirica Linn. Cod. n. 329. *a. typica* Maxim. in Mém. Biol. X. p. 709.

forma albiflora Makino.

Flower white, smaller than those of β . *orientalis* (Thunb.) Maxim.; pedicel slender, longer than spathe. Petals spathulato-obovate, gradually attenuated and cuneate towards the base.

Hab. Prov. TOSA: Uchiwara in Sakawa-mura (*T. Makino!* May 15, 1889).

Cultivated.

Centella asiatica (Linn.) Urb. var. **cristata** Makino.

Hydrocotyle asiatica var. *cristata* Makino in Bot. Mag., Tokyo, VI. (1892) p. 51.

Leaves thick, semiorbiculato-flabellate, cristato-dentate with deltoid

teeth, truncato-cuneate below, 10–20 mm. long, 13–30 mm. wide; petiole longer than blade, $1\frac{1}{2}$ –6 cm. long.

Hab. Prov. Tosa: Amadzi in Hata-gōri (*T. Makino!* Nov. 3, 1885).

Peucedanum Porphyroscias (Miq.) Makino.

Porphyroscias decursiva Miq. Ann. Mus. Bot. Lugd.-Batav. III. (1867) p. 62, et Prol. Fl. Jap. p. 250; Kanitz Anthoph. Jap. p. 28.

Angelica decursiva Franch. et Sav. Enum. Pl. Jap. I. (1875) p. 187; Franch. Pl. David. I. p. 142; Hance in Journ. Bot. (1883) p. 321; Diels in Engler's Bot. Jahrb. XXIX. p. 500.

Peucedanum decursivum Maxim. in Mél. Biol. XII. p. 472; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 335; Henry List Pl. Formos. p. 47; Palib. Consp. Fl. Kor. I. p. 98; Yabe Rev. Umb. Jap. p. 96.

Hab. Japan, common.

Var. albiflorum (Maxim.) is merely a form with white flowers, and there is the intermediate form between this and the typical form. The latter bears atro-purpureous flowers.

Rhododendron rhombicum Miq. **var. albiflorum** Makino var. nov.

Flower white.

Hab. Prov. Tosa: Zyōdaizi-yama in Sakawa, spont. (*T. Makino!* April 1885).

Very rare.

Rhododendron Tschonoskii Maxim. **a. typicum** Makino.

a. pentamerum Makino.

Rhododendron Tschonoskii Maxim. in Mél. Biol. VII. p. 339 (1870), et Rhodod. Asiæ Orient. p. 42, tab. 3, fig. 8^b–14; Franch. et Sav. Enum. Pl. Jap. I. p. 293.

Corolla-lobes 5. Stamens 5.

Hab. Japan.

b. tetramerum Makino.

Corolla-lobes 4. Stamens 4.

Hab. Japan.

In those two forms, the corolla-tube may be either longer or shorter than lobes, and the flower is also variable in size. The flower with the long-corolla-tube very closely resembles that of *Tsusiophyllum Tanakae* Maxim.

β. trinerve (Franch.) Makino.

Leaves usually larger, trinerved. Corolla-lobes 4-5, longer than the tube; tube short. Stamens 4-5.

a. pentamerum Makino.

Rhododendron trinerve Franch. in herb. Mus. Par. ex Boissieu in Bull. Herb. Boiss. V. (1897) p. 920.

Corolla-lobes 5.

Hab. Japan.

b. tetramerum Makino.

Corolla-lobes 4. Stamens 4.

Hab. Japan.

Melia japonica G. Don; Walp. Repert. V. p. 373, et Ann. IV. p. 336. Miq. Prol. Fl. Jap. p. 212; Franch. et Sav. Enum. Pl. Jap. I. p. 75; Cas. DC. in DC. Monogr. Phanerog. I. p. 456; Maxim. in Bull. Soc. Nat. Mosc. (1879), p. 7, et Pl. Chin. Potan. p. 96.

Melia Azedarach var. *subtripinnata* Miq. l. c.; Franch. et Sav. l. c.

var. semperflorens Makino var. nov.

Shrubby; trunk slender, erect, reaching to a height of about 2 m. or more, shortly branched above. Leaves bipinnate, but in flowering branchlets often simply pinnate and smaller or sometimes only ternate; leaflet ovate, irregularly coarsely serrato-dentate. Panicles 3-10 cm. long including the peduncle, sparse on new branches of this year, axillary, several-many-flowered. Flower about 17 mm. across, lilac. Stamens deep purple.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* July 20, 1903).

Gentiana Kawakamii Makino.

Gentiana nipponica var. *Kawakamii* Makino in Bot. Mag., Tokyo, XVII. (1903) p. 212.

Corolla-lobes often very minutely denticulate; plaits inclined inwards and closing the throat, somewhat contorted.

Viscum album Linn. Codex n. 7402.

a. typicum.

Berry yellowish-white.

Hab. Japan, common, on *Celtis sinensis* or sometimes *Castanea sativa* var. *japonica*.

β. rubro-aurantiacum Makino var. nov.

Berry reddish-aurantiacous, ovoid-globose, about 9 mm. across. Others as in the type.

Hab. Prov. MUSASHI: Tokyo, on *Celtis sinensis* (*H. Takeda* and *T. Makino!* May 8, 1904).

This variety is rare in Tokyo; it is also found in northern China.

Elæocarpus ellipticus (Thunb.) Makino, non Sm.

Prunus elliptica Thunb. Fl. Jap. (1784) p. 199; Willd. Sp. Pl. II. (1799) p. 986; Pers. Syn. Pl. II. (1807) p. 34; Spreng. Syst. Veg. II. (1825) p. 478.

Cerasus elliptica Loisel.; Seringe in DC. Prodr. II. p. 540.

Elæocarpus japonica Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Gen. XII. (1830) p. 63, non Sieb. et Zucc.

Elæocarpus photinæfolia Sieb. et Zucc. in Abh. Akad. Muench. IV. 2, p. 164; Miq. Prol. Fl. Jap. p. 205; Franch. et Sav. Enum. Pl. Jap. I. p. 67, non Hook. et Arn.

Elæocarpus decipiens Hemsl. in Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 94; Henry List Pl. Formos. p. 24; Ito et Matsum. Tent. Fl. Lutch. I. p. 82.

Nom. Jap. *Dzuku-no-ki*, *shiraki*, *mōgashi*, *haboso*, *shiitogi*, *horuto-no-ki*.

Hab. Japan, in places near sea in middle and southern parts.

Scævola sericea Forst. f. 'Prodr. (1786) p. 89'; Willd. Sp. Pl. I. p. 956; R. Br. Prodr. Fl. Nov. Holl. I. p. 583; Pers. Syn. Pl. I. p. 195; Schult. Syst. Veg. V. p. 161; Spreng. Syst. Veg. I. p. 752; Bl. Bijdr. p. 730; DC. Prodr. VII. p. 506; Miq. Fl. Ind. Batav. II. p. 581; Seem. Fl. Vit. p. 145.

Lobelia sericea O. Kuntze Rev. Gen. Pl. II. p. 377.

Scævola Lobelia Benth. Fl. Hongk. p. 198; Hillebr. Fl. Haw. Isl. p. 265, ex parte.

Scævola Kænigii Hook. f. et Thoms. in Journ. Linn. Soc. II. p. 8; Benth. Fl. Austral. IV. p. 86; C. B. Clarke in Hook. f. Fl. Brit. Ind. III. p. 421; Maxim. in Mél. Biol. XII. p. 488, ex parte.

Scævola velutina Presl; DC. Prodr. VII. p. 506.

Scævola Leschenoultiana DC. l. c. p. 506.

Scævola lativaga Hance in Walp. Ann. II. p. 1054, ex parte.

Hab. BONIN ISL. (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Dec. 10, 1879); YAYEYAMA ARCHIP.: Miyako Isl. (*S. Tanaka!* herb. ibid. June 6, 1891); FORMOSA: Botel-Tobago Isl. (*K. Miyake!* herb. ibid. Nov. 22, 1899); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. from Bonin Isl. (*T. Makino!* May 1904).

var. Taccada (Gærtn.) Makino.

Lobelia Taccada Gærtn. Eruct. et. Semin. Pl. I. (1788) p. 119, tab. 25.

Scævola Taccada Roxb. 'Hort. Beng. (1814) p. 15,' et Fl. Ind. I. p. 527; Buch.-Ham. in Trans. Linn. Soc. XVII. p. 250; Wight Ill. tab. 137; DC. Prodr. VII. p. 505.

Scævola Kænigii Vahl 'Symb. III. (1794) p. 36'; Lamk. Ill. Gen. II. p. 70, tab. 124, fig. 2, a; Poir. Enc. Méth. VII. p. 146; Willd. Sp. Pl. I. p. 956; Pers. Syn. Pl. I. p. 195; R. Br. Prodr. Fl. Nov. Holl. I. p. 583; Bl. Bijdr. p. 730; Schult. Syst. Veg. V. p. 160; Spreng. Syst. Veg. I. p. 752; Hook. in Bot. Mag. tab. 2732; DC. Prodr. VII. p. 505; Miq. Fl. Ind. Batav. II. p. 580; Hassk. Pl. Jav. Rar. p. 525; Hoof. f. et Thoms. in Journ. Linn. Soc. II. p. 8 (ex parte); Benth. Fl. Austral. IV. p. 86 (ex parte); C. B. Clarke in Hook. f. Fl. Brit. Ind. III. p. 421 (ex parte); Seem. Fl. Vit. p. 145; Engl. in Engler's Bot. Jahrb. VI. p. 68; Maxim. in Mél. Biol. XII. p. 488 (ex parte); Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 2.

Lobelia sericea var. *Kænigii* O. Kuntze Rev. Gen. Pl. II. p. 377.

Scævola Lobelia Buch.-Ham. in Trans. Linn. Soc. XVII. (1835) p. 250, non Linn.

Scævola Lobelia Benth. Fl. Hongk. p. 198; Hillebr. Fl. Haw. Isl. p. 265, ex parte.

Lobelia Plumieri Burm. Fl. Ind. p. 186, non Linn.

Scævola Plumieri Bl. Bijdr. p. 730, non Vahl.

Scævola Bela-Modugam Raem. et Schult. Syst. Veg. V. p. 163; DC. Prodr. VII. p. 505.

Scævola montana Labill.; DC. l. c. p. 506.

Scævola macrocalyx De Vriese; Walp. Ann. II. p. 1056.

Scævola chlorantha De Vriese; Walp. l. c. p. 1056.

Scævola Lambertiana De Vriese; Walp. l. c. p. 1056.

Scævola lativaga Hance in Walp. l. c. p. 1054, ex parte.

Cerbera salutaris Lour. Fl. Cochinch. (1790) p. 136.

Hab. SULPHUR ISL. (*N. Okada!* herb. Sc. Coll. Imp. Univ. Tokyo, Nov. 10, 1887); FORMOSA: Kelung (*T. Makino!* herb. ibid. Oct. 31, 1896), Dainan (*K. Miyake!* herb. ibid. Nov. 1899), Botel-Tobago Isl. (*K. Miyake!* herb. ibid. Nov. 22, 1899); AMAMI ŌSHIMA: Urakami (*T. Uchiyama!* herb. ibid. Dec. 1900).

Anemone (*Pulsatilla*) **hirsutissima** (Pursh) Makino.

Pulsatilla hirsutissima Britton in Ann. N. Y. Acad. VI. p. 217 (1891); Huth in Engler's Bot. Jahrb. XXII. p. 589 (1897).

Olematis hirsutissima Pursh Fl. Amer. Sept. II. (1814) p. 385.

var. Taraoi Makino.

Anemone patens var. *hirsutissima* subvar. *Taraoi* Makino in Bot. Mag., Tokyo, XVII. (1903) p. 39.

Hab. Prov. CHISHIMA (KURILE ISLANDS); Brat Chirpoef Isl. (*C. Tarao!* June 18, 1892).

Scutellaria transitra Makino sp. nov.

Scutellaria nipponica Makino in Bot. Mag., Tokyo, VI. (1892) p. 54, non Franch. et Sav.

Perennial, 10–35 cm. high, stoloniferous; stolons hypogæous, slender, rooting. Stems erect, slender, simple or with a few branches above, tetragonous, thinly pubescent or nearly glabrous, with remote nodes, leafy throughout. Leaves opposite, petiolate, subdeltoid-oval or oval-ovate, obtuse, truncate or subcordate at the base, dentate with deltoid or deltoid-ovate acutish or obtuse teeth, membranaceous, very thinly dispersed with pilose hairs on both surfaces or nearly glabrous, 1–5 cm. long, 1–3 $\frac{1}{2}$ cm. wide, the superior ones passing the bracts; petiole thinly pilose, $\frac{1}{2}$ –4 cm. long, shorter or sometimes longer than the blade. Raceme terminal, 1–14 cm. long, secundly flowered; rachis thinly pubescent; bracts ovato-lanceolate or narrowly ovate, the lower ones often similar to leaves in size and form, the superior ones gradually diminished in size and the uppermost one about 2–3 mm. in length. Flowers erect, loose, pedicellate, opposite as-

ending-erect, 17-22 mm. long, caeruleo-violaceous above; pedicel very short, $1\frac{1}{2}$ -3 mm. long, thinly pubescent. Calyx campanulate, shallowly 2-labiate with entire equal lips, thinly pubescent with glandular patent hairs externally, green, $2\frac{1}{2}$ -3 mm. long, but $3\frac{1}{2}$ mm. in length and compressed and close in fruit, appendage erect, lato-semiorbicular, thinly glanduloso-pubescent and ciliated, slightly concavo-convex, $3\frac{1}{2}$ -4 mm. broad in fruit. Corolla thinly pubescent with patent glandular hairs, white but caeruleous above; tube long, slightly arcuate, enlarged above, somewhat geniculate and subgibbose at the base; limb much shorter than the tube, the upper lip shorter and much smaller, 2-lobed into oval-ovate obtuse lobules, the lower lip ample, the lateral lobes obtuse deltoid-oval and shorter than the upper lip, the midlobe much broad, patent, semiorbicular, 8-9 $\frac{1}{2}$ mm. broad, obscurely trilobed, the midlobule broader than the lateral lobules and subtruncate or sub-emarginate. Stamens didynamous, inserted above the middle of the corolla-tube, the anterior ones equal to the upper lip of corolla in height; filament pubescent below; anther ciliated on the margin of anther-cells, divergent, one of cells in those of the anterior stamens minute and imperfect. Style about equal to stamens in height, filiform, glabrous, curved forwards under the stigma; stigma bifid, the upper lobe minute and much shorter; ovary short-stipitate, disk large. Nutlet $1\frac{1}{2}$ mm. across, fulvous, muricate all over. Flowers in June-July.

Hab. Prov. TOSA: Okasaki in Sakawa (*T. Makino!* May 18, 1889); Prov. MUSASHI: Nakatsugawa in Chichibu (*T. Makino!* July 18, 1888); Prov. SHIMOTSUKE: Nikkō (*T. Makino!* July 18, 1900); Prov. IYO: Wariishi in Shimo-ukena-gōri, (*K. Okudaira!* June 1894); Hokkaidō (*L. Bœlmer!* herb. Sc. Coll. Imp. Univ. Tokyo, June 1874); Prov. ISHIKARI: Sapporo (*Herb.!* *ibid.*); Prov. OSHIMA: Hakodate (*K. Miyabe* and *Y. Tokubuchi!* herb. *ibid.* July 10, 1890); Prov. SHINANO: Mt. Usui-tōge (*Herb.!* *ibid.* July 19, 1880), Mt. Togakushi (*R. Yatabe* and *J. Matsumura!* herb. *ibid.* July 10, 1884).

This comes near to *Scutellaria indica* Linn. and *var. japonica* (Morr. et Decne.) Franch. et Sav., differing from these by the above mentioned habits.

Scutellaria indica Linn. Cod. n. 4358, β . ***japonica*** (Morr. et Decne.) Franch. et Sav. Enum. Pl. Jap. I. p. 376.

forma parvifolia Makino.

Dwarf, caespitose, many-stemmy, thinly pubescent to tomentose-pubescent. Leaves small, 5–15 mm. long, 4–14 mm. broad, petiolate, oval-ovate, obtuse, truncate or truncato-subcordate at the base, crenate; petiole shorter than the blade, 2–9 mm. long. Flower as in those of *var. japonica* Morr. et Decne. (sp.), but sometimes smaller. Nutlet minute, muricate all over, black. Flowers in May.

Hab. Prov. Tosa: Sakawa (*T. Makino!* 1885), Tanokuchi in Hata-gōri (*K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Oct. 26, 1891); Prov. SETSU: Ikuta (*Herb.!* *ibid.* May 10, 1879); Prov. MUSASHI: Mt. Takao (*T. Makino!* May 18, 1902).

Stephanotis (*Jasminanthes*) **chinensis** Champ. in 'Hook. Kew Journ. Bot. V. p. 53'; Walp. Ann. V. p. 503; Benth. Fl. Hongk. p. 227; Maxim. in Mém. Biol. IX. p. 818; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 114; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 377.

Stephanotis japonica Makino in Bot. Mag., Tokyo, VI. (1892) p. 53.

A tall vigorous voluble shrub; stem and main branches glabrate, brownish-grey; branches and branchlets slender, terete, patent-retroscarsely pubescent but tomentose in youngest ones, nodes mostly remote; lenticels dispersed, small, rounded to elliptical. Leaves opposite, petiolate, elliptico-oblong, ovato-elliptical, oblong-ovate, or ovate, abruptly and shortly acuminate with an obtuse or acutish tip, rounded to cordate at the base, entire and minutely ciliated, membranaceous or chartaceo-membranaceous, deep-green above, slightly paler beneath, 4½–17 cm. long, 3–11 cm. wide, midrib and veins pubescent and the hairs denser beneath, young leaves dispersed with minute pubescent hairs; veins erect-patent, connected before reaching the margin; about 6–8 on each side; petiole much shorter than the blade, 9–22 mm. long, erect-patent or spreading or reflexed, pubescent. Cyme on branchlets of this year, axillary, umbellate, shorter than leaves, peduncled, 2–5-flowered; peduncle straight, short, solitary, erect-patent, or patent, rarely one-branched, thinly pubescent as is the pedicel, 3–14 mm. long, pedicels straight, narrowly terete, thicker under the flower, viridescens, erect or erect-patent, much longer than the peduncle, 15–28 mm. long; bracts small, scaly, about 3–5, placed at the base of pedicels, unequal in size, lato-subulate, lato-ovate, ovato-oblong, oblong, lato-linear, linear, or sometimes spathulato-linear, usually obtuse, about 1–4 mm. long, pubescent towards the margin and ciliated. Flower large, white, fragrant, 3½–6 cm. across, often

with black juice filling the corolla-tube. Calyx 5-sepaled, rounded-obtuse at base, 6-13 mm. long, glabrous but minutely ciliated, green; sepals imbricated, somewhat unequal, erect, narrowly ovate, ovato-lanceolate, or narrowly oblong, obtuse or acutish, entire, thickish below, midrib more or less prominent dorsally, veinlets irregularly anastomosing, with free extreme venules. Corolla hypocrateriniform, subcarinose; tube exerted, cylindrical, slightly swollen at the base, 11-13 mm. long, 6-7 mm. across, glabrous and longitudinally 5-sulcate below externally, marked with longitudinally pilose lines 5 above and 10 below internally; lobes 5, arcuato-patent, longer than the tube, angustato-lanceolate to ovato-lanceolate, slightly falcate, obtuse or acutish, entire and laxly ciliolate, minutely auriculate on one side at the base, sinistrorsely convolute in praeffloration, 17-30 mm. long, 6-9 mm. wide, subtrinnerved below, midrib slender, veinlets delicate and irregularly anastomosing. Genitals included, glabrous, about 7-8 mm. long. Staminal corona 5, narrowly deltoid, erect, flattened and longitudinally subangulate in centre above dorsally, almost entirely adnate to the column (connate filaments) and shorter than it and the obtuse tips slightly free, black when dry. Column thick, 5-gonous; anthers terminal, free, membranes surrounding the stigma, oblong-elliptical or narrowly oblong, obtuse, concave, about 3-4 mm. long, slightly exceeding the stigma; pollinia small, about $\frac{3}{4}$ mm. long, obovato-oblong, rounded at the top, erect, very shortly pedicellate; corpuscle shorter than pollinia, ovato-deltoid, acute. Style crowned on the ovaries, short, thick, close to the column; stigma thicker than the style, clavato-obovate, semispherical one-half above, shortly bilobed at the top. Ovaries 2, collectively ovato-oval or conico-oval and obtuse, glabrous, small, about 2 mm. long, many-ovuled, each slightly compressed dorsally (semiorbicular in cross section); ovules minute, several-seriate, pendulous, obovato-elliptical or elliptical, with a short funicle; placenta thickish. Follicles 2, strongly divaricate, often with persistent calyx, elongatedly horn-shaped, gradually attenuated above, straight, glabrous, viridescent, about 10-16 cm. long, $1\frac{2}{3}$ -2 cm. across, many-seeded, with coriaceous carpel; pedicel 2-4 cm. long. Seeds pendulous, numerous, imbricated, compressed, ovate, narrowly winged on margin, umber, comose with many and long sericeous hairs, glabrous, 12-14 mm. long; albumen ovate; embryo straight, cotyledons flat, elliptical, rounded at the apex and base, veined, caulicle much shorter than the cotyledon. Flowers in May-June.

Hab. Prov. Tosa: Godaisan in Kōchi (*T. Makino!* May-June 1893), Sakawa (*T. Makino!* Nov. 1892), Mt. Yokogura (*T. Makino!* 1892),

Urado (*T. Makino!* Nov. 1895); Prov. ISE: Mt. Onigazyō in Watarayegōri (*Z. Umemura!* March 31, 1894); Prov. AWA [Bōshū] (Herb. ! Sc. Coll. Imp. Univ. Tokyo), Mt. Kiyosumi (*T. Makino!*).

Distrib. Hongkong, Kwantung.

I could not obtain the typical specimen itself from China, so the Japanese plant was identified according to its description. In Japan, this species is found in the southern part and warmer districts of the middle part. My thanks are due to Mr. Torama Yoshinaga, who kindly sent me the fruit and its figure.

Styrax Shiraiana Makino in Bot. Mag., Tokyo, XII. (1898) p. 50.

A deciduous small tree; branches terete, flexuous, glabrous, but tomentose with fasciculated hairs (which are often caducous) in the shoot of this year, provided with erect-patent branchlets, drab-castaneous, fulvo-castaneous, or castaneous, the outer bark thin and often peeling off. Leaves alternate, petiolate, mostly 3 or 4 on branchlets (often more on the terminal branchlets), the terminal one largest, rhombic-ovate, but elliptical or oval-elliptical and approximately placed in the inferior ones, on the front margin unequally and coarsely sinuato-dentate with mucronate deltoid sharp teeth and open deltoid sinuses, but entire on the lower margin, shortly projected into a narrowly deltoid mucronate acute or obtuse tooth at the apex, cuneate or cuneate-obtuse or sometimes rounded at the base, 3-12 cm. long, 2-11½ cm. broad, sparingly dispersed with stellate hairs on both surfaces, densely pilose with whitish fasciculate hairs at the axil of the midrib and veins beneath, green and concolorous, chartaceous, penninerved, the midrib and veins elevated and often covered with fulvous fasciculate hairs beneath; veins 4-7 on each side, erect-patent; main veinlets transverse between veins; petiole tomentose with fasciculate hairs (which are often caducous), enlarged and entirely inclosed the bud at the base, 3-18 mm. long. Raceme cernuous, simple, terminating the lateral short branchlets, or rarely axillary in the upper portion of branches, secundly 3-13-flowered, about 4-6 cm. long. foliiferous below (the uppermost leaf often reduced in size, acuminate, cuneate-obovate); rachis hirsute-tomentose with stellate-fasciculate drab-fulvous hairs as is the pedicel; bracts filiform-linear, tomentoso-pubescent with stellate-fasciculate hairs, 1-3 to each flower, about equal to or slightly shorter than the calyx, attached to the apical portion of the pedicel or sometimes to the lower portion of the calyx, persistent. Flowers nutant, very shortly pedicellate, about 2½-

2 $\frac{2}{3}$ cm. long, 12 mm. across, white, the lower few flowers axillary; pedicel 1 $\frac{1}{2}$ –3 mm. long. Calyx campanulate, incano-tomentose with stellato-fasciculate hairs, ferrugineo-fulvous below, unequally usually 5–6-fid, 7–10 mm. long; lobes more or less recurved, deltoid or narrowly deltoid, acute, some of them unequally 2 or sometimes 3-fid. Corolla much exerted, infundibuliform, deeply 5–7-fid, valvato-imbricate in aestivation, subtomentose with short stellate hairs externally; lobes oblong, deltoid-oblong, or ovato-elliptical, acute. Stamens included, 11–12, monadelphous into a short tube below, 1-seriate, erect, inserted to the corolla-tube, about 11–12 mm. long, thinly pubescent, white, the free portion linear-filiform; anther erect, lato-linear, mucous, introrse, adnate to the connective, with parallel cells, 3–3 $\frac{1}{2}$ mm. long, yellow. Style erect, subulato-filiform, straight, equal to stamens in height, pubescent below, about 16–19 mm. long; stigma 3-lobed; ovary subglobose, at the base adnate to the base of the calyx-tube, tomentoso-pubescent above, thick-walled, 3-locular, about 2 $\frac{1}{3}$ mm. across; ovules about 12 in each loculament. Fruit ovoid-globose, about 9–11 mm. across, accompanied by the 2–3-ripped persistent calyx below, covered with closely pressed pale tomentose hairs, beaked with the basal remainder of the style, depressed-rounded at the top, dehiscent from the base, 1– sometimes 2-seeded; carpel coriaceous, thickish. Seed ellipsoid-globose (in the solitary state), rounded and with a subcuspidato-acute point at the top, marked with longitudinally 3-angulate lines and 3-subsulcate lines, glabrous, castaneous, albuminous, about 8 mm. long; hilum oblique, broad; testa crustaceous; embryo erect, slightly shorter than albumen, cotyledons ovate or oval-ovate, flat, caulicle nearly as long as the cotyledon. Flowers in June.

Hab. Prov. SHIMOTSUKE: Nikkō (*T. Makino!* June 1901, flower, Sept. 1901, fruit), Mt. Kōshin (*T. Makino!* Sept. 11–12, 1901); Prov. SHIZANO: Kiso (*Suekichi Gotō!*).

This species is allied to *Styrax Obassia* Sieb. et Zucc., having a very different appearance.

Draba (*Leucodraba*) **shiroumana** Makino in herb. Aug. 1903.

About 4–9 cm. high (attenuating about 18 cm. high in cultivation) in fruit. Perennial, densely caespitose; caudex many-branched, branches erect or ascending, foliiferous at the top. Rosulate leaves spreading or erect-patent, spatulato-linear, gradually narrowed into a petiole below, acute,

entire or pauci-serrate, glabrous on both surfaces, but ciliated on margin with spreading or erect-patent pilose hairs, thickish, green, concolorous, 6–13 mm. long, $1\frac{1}{2}$ –2 mm. broad (longer and broader under cultivation), nerves inconspicuous; cauline leaves usually 1–3 or sometimes 4, remotely alternate, erect-patent, sessile, semiamplexicaul, oblong-linear or subulato-linear, acute or subobtuse, entire or pauci-serrate, laxly ciliated on margin, 5–12 mm. long, $1\frac{1}{2}$ –2 mm. broad (often longer and broader under cultivation). Stems subnumerous, erect, gracile, glabrous, usually simple, rarely pauci-ramose. Raceme erect, 2 to several- (often numerous under cultivation) flowered; rachis gracile, glabrous; pedicels erect-patent, glabrous, gracile, shorter than the flower. Flower small, 3– $3\frac{1}{2}$ mm. in diameter, white. Sepals erect-patent, elliptical, obtuse, concave, glabrous, delicately sub-trinerved, light green, 2– $2\frac{1}{3}$ mm. long. Petals half-patent, longer than sepals, cuneato-obovate, emarginate, shortly unguiculate, $3\frac{1}{2}$ mm. long. Stamens as long as sepals; filament filiform, glabrous; anther minute, ovato-elliptical. Ovary oblong, viridescent, glabrous; style very short, with a truncato-subcapitate stigma. Silicle erect-patent, lato-linear to oblong-linear, attenuated towards both ends, straight or subfalcate, often slightly twisted, with a very short and minute style which not bifid at the stigma, uneven on surface, 4–10 mm. long, $1\frac{1}{2}$ – $2\frac{1}{2}$ mm. broad; carpel membranaceous, loosely and delicately reticulato-veined on each side of the delicate midrib; pedicel shorter than the silicle, erect-patent, $1\frac{2}{3}$ – $4\frac{1}{2}$ mm. long. Seeds several to many, oblong-ellipsoid, compressed, rounded-obtuse at the apical end, acutish or obtuse at base, with a minute and short funicle, 1– $1\frac{1}{2}$ mm. long.

Hab. Prov. SHINANO: Mt. Shirouma (*B. Ioki!* August 1903), Mt. Yarigadake near Mt. Shirouma (*K. Tanaka!* Aug. 1903); Prov. MUSASHI: Tokyo, cultivated from Mt. Shirouma (*N. Aoki!* May 1904).

Rhamnus (*Eurhamnus*) **Yoshinoi** Makino sp. nov.

A shrub, divaricately or patently subopposite-ramose, loosely spinose, spines terminating branchlets; branches and branchlets terete, glabrous, purplish-brown and often with grey colour. Leaves deciduous, alternate on the 'langtrieb' but few-several-fasciculate on the 'kurztrieb,' chartaceo-membranaceous, obovate, cuneate towards the base, abruptly acuminate at apex, mucronato-serrulate, green and glabrate (thinly puberulent when young) above, very slightly paler and thinly pubescent (punctato-purplish

in old ones) beneath, 2–8 cm. long, 1–4 cm. broad; midrib prominent beneath; lateral veins 3–6 on each side, ascending and arcuate; veinlets not conspicuous. Flower dioecious, pedicellate, one to a leaf-axil, approximately placed at the base of the ‘langtrieb’ of this year and at the top of the ‘kurztrieb,’ glabrous, yellowish-viridescent, 6 mm. long. Male flower: pedicel gracile, glabrous, about as long as the flower. Calyx 4-fid; lobes erect, subulato-lanceolate, acuminate with a subcallose point, trinerved without veinlets; tube equal to or hardly shorter than lobes in length, obconico-campanulate, acute at the base, disk very thin. Petals 4, inserted to the throat, one-half as long as the calyx-lobes, thinly membranaceous, elliptical, acute, entire, one-nerved with a few and loose veinlets. Stamens 4, longer than petals but shorter than calyx-lobes; filament subulate; anther linear, as long as the filament. Rudimentary pistil short and minute. Female flower: pedicel gracile, glabrous, longer than the flower. Calyx 4-fid; lobes erect, longer than the tube, subulato-lanceolate, acuminate with a subcallose point, trinerved without veinlets; tube globose, the upper portion deciduous as well as the lobes, disk very thin. Petals imperfectly present or none, linear, entire or bifid above. Rudimentary stamens minute, subulate. Pistil slightly exerted; ovary free, globose, thick at the apex, a little exerted from the remaining calyx-tube, 3-locular; ovule solitary in each locument; style erect, thickish, 3-sulcate, glabrous, 3-fid, arms hardly shorter than the main portion, arcuato-erect-patent; stigma arcuate, linear-oblong. Fruit obovoid-globose, longitudinally 3-sulcate, with 3 pyrenae, girt with the persistent flat lower portion of the calyx at the base, about 7 mm. across, smooth, glabrous, green; pyrena cartilaginous; 1-seeded, indehiscent (?); pedicel 8–11 mm. long. Seed obovoid, close but not adherent to pyrena, 6 mm. long, nigrescent, smooth, shining, one-sulcate dorsally, the groove close; testa thin but subcrustaceous. Flowers in May.

Hab. Prov. BITCHŪ in Chūgoku: Near Miyagōchi in Atetsu-gōri (*Zensuke Yoshino!* no. 573, Aug. 28, 1902, fruit, May 12, 1903, flower).

A rare species; besides Chūgoku, it is yet unknown from other localities.

Rhamnus (*Emrhamnus*) **dahurica** Pall. ‘It. III. App. p. 721,’ et Fl. Ross. II. p. 24, tab. 61; Poir. Enc. meth. IV. p. 467; Willd. Sp. Pl. I. p. 1097; Pers. Syn. Pl. I. p. 239; DC. Prodr. II. p. 25; Ledeb. Fl. Ross. I. p. 502; Maxim. Prim. Fl. Amur. p. 76; Regel Tent. Fl.

Ussur. n. 122, pro parte, excl. syn.; Diels in Eugler's Bot. Jahrb. XXIX. p. 459.

Rhamnus cathartica γ. *davurica* Maxim. Rhamn. Or.-Asiat. p. 9; Korsh. in Act. Hort. Petrop. XII. p. 321.

var. nipponica Makino.

Rhamnus nipponica Makino ined.

A shrub or small tree, spinose; trunk unarmed; branches atropurpureo-griseous; branchlets erect-patent, or subhorizontally patent, subopposite, glabrous, griseous or luteo-griseous; bud-scales imbricated, coriaceous, ciliated. Leaves alternate or subopposite, petiolate, lanceolate-oblong, oblanceolato-oblong, lato-lanceolate, but obovato-oblong, or obovato-elliptical, or elliptical in those of the lower portion of branchlets, shortly acuminate or abruptly short-acuminate or abruptly cuspidate, acute or obtuse and often oblique at base, crenulato-serrulate with narrowly marginate teeth having a minutely mucronate point in front, coriaceo-chartaceous, nearly concolorous, often purprascens beneath in old ones, glabrous but slightly pubescent in the axil of veins beneath, 3-16 cm. long, 2-5 cm. broad; midrib straight or scarcely flexuous, impressed above, prominent beneath; veins 4-7 on each side, loose, ascending; veinlets finely and conspicuously reticulated beneath; petiole glabrous, 10-25 mm. long; stipule setaceous or subulato-setaceous, shorter than the petiole, caducous, 4-7 mm. long. Flowers dioecious, placed in the leaf-axil in the portion of branchlets of this year, yellowish-viridescent, glabrous. Male flowers 1-18-fasciculate, dense, longer than the petiole of leaves of that place; pedicel gracile, glabrous, slightly shorter or longer than flowers. Calyx 5 mm. long; tube obconical, acute at base, disk very thin; lobes 4, erect-patent or spreading, 1½-2-times as long as the tube, ovato-lanceolate or deltoid-lanceolate, subcallosi-acutish at apex, trinerved and usually without veinlets, lateral veins disappear before reaching the apex. Petals 4, shorter than calyx-lobes, oblong or obovato-elliptical, shortly attenuated at base, obtuse, 1-nerved with a few loose veinlets, scarcely longer than one-half of the calyx-lobe, thinly membranaceous. Stamens 4, shorter than the calyx-lobe, but scarcely longer than the petal, erect; filament subulate; anther shorter than filament, oblong. Rudimentary pistil minute and short, with the depressed-globose ovary and the bifid style. Female flowers 1-3-fasciculate, usually shorter than the petiole of leaves of that place; pedicel gracile, glabrous, 4-8 mm. long. Calyx 4 mm. long; tube short, obconico-semispherical, disk thin; lobes 4, spreading or erect-patent, nearly thrice as long as the tube, oblong-lanceolate, ovato-lanceolate, or subulato-lanceolate, attenuated above with an

obtuse and subcallose point, trinerved without veinlet, one of lateral veins disappears before reaching the apex. Rudimentary petals and stamens minute and setaceous. Pistil slightly exerted; ovary globose, longer than the calyx-tube, free, glabrous, 2-3-locular; ovule solitary in each loculament; style erect, 2-3-fid, arms shorter than the main portion, patent-arcuate, with the oblong stigma. Fruit globose, mucous, black when mature, sacculent, about 7-8 mm. across, usually with 2 pyrenae, girt with a persistent plane calyx-tube at the base; pyrena broadly oblong, black, smooth, indehiscent, thin but cartilaginous, 5-5½ mm. long. Seed adherent to pyrenae, ovato-elliptical, with a thin testa, thinly but densely opaque-nigro-furfuraceous, deeply sulcate dorsally, the groove close pedicel 4-10 mm. long.

Nom. Jap. *Kurotsubara*, *Nabekōzi*, *Okaroumemodoki*, *Ushikoroshi* (after Keisuke Itō).

Prov. MUSASHI: Tokyo (Herb.! Sc. Coll. Imp. Univ. Tokyo), Bot. Gard. Koishikawa in Tokyo, cult. (Herb.! *ibid.* May 18, 1880; *T. Makino!* June 1896), Near Katayama (*R. Yatabe* and *J. Matsumura!* herb. *ibid.* May 5, 1881), Shimura (*T. Makino!* 1888, Sept. 7, 1893, May 22, 1898, Oct. 30, 1898), Near Hachioji (*T. Makino!* Oct. 28, 1899), Near Kami-kunugida (*T. Makino!* June 1901), Near Asagawa (*T. Makino!* May 1902), Shimoshakushi (*T. Makino!* May 20, 1900); Prov. SHINANO: Mt. Wada-tōge (*R. Yatabe* and *J. Matsumura!* herb. *ibid.* July 23, 1880), Mt. Togakushi (*R. Yatabe* and *J. Matsumura!* herb. *ibid.* July 10, 1884); Prov. MŪSU: Fukuoka (*R. Yatabe!* herb. *ibid.* Aug. 20, 1878).

Common in middle and northern Japan. It differs from the type by narrower leaves and conspicuous reticulations of veinlets.

Lotus corniculatus Linn. **var. japonicus** Regel 'Ind. Sem. Hort. Petrop. (1864) p. 23'; Franch. et Sav. Enum. Pl. Jap. I. p. 97; Palib. Conspect. Fl. Kor. I. p. 61.

Lotus corniculatus Thunb. Fl. Jap. p. 291; A. Gray Bot. Jap. p. 385; Miq. Prol. Fl. Jap. p. 231.

forma a. concolor Makino.

Corolla entirely yellow.

Hab. Japan, common.

forma b. versicolor Makino.

Corolla at first yellow and then turning to scarlet.

Hab. Prov. MUSASHI: Near Tokyo (*T. Makino!* June 1904); Prov.

KADZUSA: Ichiuomiya (*T. Makino*! June 24, 1904).

Rare.

Siegesbeckia orientalis Linn. Cod. n. 6516.

forma a. pubescens.

Usually stouter than the next form. Stem villosopubescent. Leaves pubescent.

Hab. Japan, common.

forma b. glabrescens.

Stem puberulent. Leaves puberulent.

Hab. Japan, common.

forma c. angustifolia Makino.

Stem pubescent. Leaves pubescent, oblong-lanceolate, or lanceolate, petiolate, obtuse, sinuato-dentate.

Hab. KŪSŪ (*T. Kawakami*!).

Rare.

Rhododendron indicum Sweet var. **sublanceolatum** (Miq.) Makino.

Rhododendron sublanceolatum Miq. Ann. Mus. Bot. Lugd.-Batav. II. (1865-66) p. 163, et Prol. Fl. Jap. p. 95; Maxim. Rhod. As. Orient. p. 35, et in Engler's Bot. Jahrb. VI. p. 64; Franch. et Sav. Enum. Pl. Jap. I. p. 290; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 31; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 608.

Azalea sublanceolata O. Kuntze Rev. Gen. Pl. II. p. 387.

Rhododendron indicum var. *sinensis* Buerger herb. ex Miq. Eric. Jap. in Ann. Mus. Bot. Lugd.-Bat. I. p. 33.

Nom. Jap. *Tō-tsutsuzi* (Chinese Azalea), *Kerama-tsutsuzi* (Kerama Azalea).

Hab. LIUKIU: Kunchan in Isl. Okinawa (*Y. Tashiro*! herb. Sc. Coll. Imp. Univ. Tokyo, March 1887; *H. Kuroiwa*! April 1897), Near Ōgimi in Kunchan in Isl. Okinawa (*J. Matsumura*! herb. ibid. May 1897); Prov. MUSASHI: Tokyo, cult. (*J. Matsumura*! herb. ibid. May 15, 1901), Yokohama, cult. (*T. Makino*! May 6, 1896).

This grows spontaneously in Liukiu, as Tashiro's, Kuroiwa's and Matsumura's specimens prove.

Rhododendron (*Tsusia*) **tosaense** Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. (1892) p. 53.

An evergreen small shrub, usually verticillato-ramose; branches sub-purpureo-rufous; branchlets terete, gracile, rufous, adpressed-setoso-strigose. Leaves small, crowded at the top of branchlets, but alternate in shoot, erect-patent, linear-oblongate to oblanceolate, mucronato-acute, gradually attenuated below to a petiole, entire, adpressed-pilose and adpressed-ciliated with pale-rufous hairs, which are white on the upper surface and denser towards the petiole, subcoriaceous, often minutely punctate under lens beneath, 5-29 mm. long including the petiole, $1\frac{1}{2}$ - $7\frac{1}{2}$ mm. wide; veins loose and unequally 2-4 on each side but usually inconspicuous. Flowers 1-6 to a terminal bud, shortly pedicellate, about 3 cm. across, purpureo-lilac; pedicel longer than sepals, 4-6 mm. long, adpressed-pilose; bud-scales ovato-oval, often mucronate or with an elongated point, concave, chartaceo-membranaceous, pilose in centre dorsally, ciliated above, not viscid, 3-6 mm. long, deciduous. Sepals small, oval-elliptical or ovato-elliptical, obtuse or rounded at apex, pilose externally, ciliated with erect pilose hairs, nearly nerveless, $1\frac{1}{2}$ mm. long, persistent. Corolla slightly oblique and campanulato-infundibuliform, 5-fid, spotted on the posterior side internally glabrous; lobes orbicular or elliptico-orbicular, rounded at apex; tube about as long as lobes. Stamens often 6 and sometimes 5 or 7 intermixed, unequal, the longer ones as long as the corolla; filament filiform, paleaceo-pubescent below; anther obovoid-oblong, but obovoid in those of shorter filaments. Ovary ovoid, pilose with erect hairs, about 2 mm. long; style filiform, glabrous, slightly longer than the longer stamens and corolla; stigma thick, truncate and 5-lobed on face. Capsule ovoid, shortly attenuated above, about 9 mm. long, adpressed-strigoso-pilose, 5-carpellary; seeds minute, elliptical and subangulate, ferruginose.

Hab. Prov. Tosa: Takaoka-gōri (*T. Makino!* 1885), Sōdayama-mura (*T. Makino!* April 5, 1887), Kamibun-mura (*T. Makino!* Dec. 1888, January 9, 1892).

This comes near *Rhododendron serpyllifolium* Miq., but flowers larger and 1-6-fasciculate; leaves narrower, more tapering, and more hairy; or a variety of *Rh. indicum* Sweet? It is rather common on hill sides in the middle parts of the province of Tosa in Shikoku.

Rhododendron indicum Sweet var. **Tamurai** Makino var. nov.
(With Figure.)

An evergreen dwarf shrub; numerous ramose, densely leafy; branchlets adpressed-strigose, brownish-fuscous. Leaves crowded at the top of branchlets, spreading, shortly petiolate, obovate, obovato-elliptical, or cuneato-obovate, rounded or truncato-rounded and with a mucronate point, rigid, coriaceous-chartaceous, green and subshining above, paler beneath, disparsed with adpressed-pilose pale-fulvous hairs, adpressed-ciliated, 10–27 mm. long, 7–17 mm. wide; veins very loose and inconspicuous; petiole 3–5 mm. long, adpressed-pilose. Bud-scales several, the lower ones minutely mucronate,



Rhododendron indicum Sweet var. *Tamurai* Makino.
(nat. size.)

concave, firmly membranaceous, minutely ciliated, pubescent above, about 5–10 mm. long, the upper ones longer and oblong to linear-filiform, membranaceous, about attaining about 14 mm. long. Flowers about 1–2 to a bud, large, about 6–8 cm. across, light lilac-rose; pedicel terete, adpressed-strigose, 10–13 mm. long. Sepals small, short, deltoid-ovate or semiorbicular, ciliated with white rather long erect hairs, shorter than the ovary,

1½–2 mm. long, light green. Corolla infundibuliform, 5-parted, rose-spotted on the posterior side; lobes spreading, elliptical or oblong-elliptical, rounded at the apex, undulate on margin; tube rather short, puberulent below internally. Stamens 10, included, unequal, the long one slightly longer than the corolla-tube; filament filiform, white, sub-retroresely pubescent below, the longest one about 33 mm. long and shortest one about 20 mm. long; anther small, obovato-elliptical or obovato-oblong, pale fulvous. Ovary ovoid, piloso-pubescent with silky erect hairs, green, 3–3½ mm. long; style gracile, declinate, slightly longer than the anterior stamen, about 33–38 mm. long; stigma depressed-capitate, with a 5-lobed face, greenish-pale or rose-purpurascens. Flowers in June.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* June 1904).

Rare; probably a garden variety, cultivated by Mr. Kageyoshi Tamura, a horticulturist of Tokyo.

Hypericum (Euhypericum) **nikkoense** Makino sp. nov.

Perennial, suffruticous, many-stemmy, densely leaved, quite glabrous, attaining 5 decim. in height. Stems caespitose, erect or ascending, slender, smooth, terete, without decurrent line, slightly compressed and often ramose above, rufo-purpurascens below and viridescens above when recent, but ferruginous when dried, attaining about 4 mm. in diameter at the base in the largest one, internodes usually shorter than leaves. Leaves patent, sessile, narrowly lanceolate, lanceolate, linear-oblong, or oblong-lanceolate, but ovato-lanceolate in superior ones and elliptico-oblong in inferior ones, obtuse or subemarginate at apex, obtuse or rounded and semi-amplexicaul, entire, minutely pellucid-punctate (unequal in size), loosely nigro-punctate on margin, green above, subglaucous beneath, attaining about 3½ cm. long, nearly 1½ cm. wide; lateral veins about 3–4 on each side, obliquely parallel to the midrib. Cyme terminal, loosely subnumerous- or numerous-flowered; branches erect-patent, gracile, secundly loose-flowered; bracts similar to leaves, but often slightly smaller; bracteoles small, ovato-linear or oblong-linear. Flower short-pedicellate, 12–16 mm. across, yellow; pedicel shorter than flowers, capsules, and bracteoles, 1–4 mm. long. Sepals 5, erect-patent, unequal in size, linear-lanceolate or oblong-linear, acutish, entire, very thinly nigro-punctate on surface, loosely nigro-punctate on margin, tri-quinquennerved, viridescens, 3–8 mm. long in flower. Petals 5, patent, longer than sepals, slightly oblique in form, oblong to oblong-elliptical, or

obovato-oblong, rounded-obtuse at apex, narrowed towards the base, very loosely nigro-punctate on margin above and externally, several-nerved. Stamens numerous, triadelphous, erect-patent, slightly shorter than petals, yellow; filament filiform; anther minute, didymous, with a black tubercle at the apex. Pistil equal to stamens in height; ovary conico-ovoid, 3-locular, many-ovuled; styles 3, as long as the ovary, erect-patent, filiform; stigma punctate, purpurascens; ovules oblong. Capsule narrowly conical, tapering above, about 7-10 mm. long, $2\frac{1}{2}$ -5 mm. across, thinly carpellary, 3-sulcate, longer than the persistent calyx, with persistent styles, finely striato-nervate, 3-locular, many-seeded. Seed cylindrical-oblong, straight or somewhat arcuate, minutely and obscurely trabeculate, yellowish-brown, about $\frac{1}{4}$ mm. long. Flowers in July.

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (*T. Makino!* July 17, 1900, Aug. 29, 1901, Sept. 14, 1901, Aug. 1903); Prov. MUSASHI: Tokyo, cultivated from Nikkō (*T. Makino!* July 1904).

Hypericum erectum Thunb. **var. cæspitosum** Makino var. nov.

Suffruticous, attaining about 40 cm. in height, glabrous. Stems caespitose, erect or ascending, slender, reddish-purple, castaneo-purple, or fusco-rufocastaneous when dried. Leaves ovato-lanceolate or angustato-oblong, attaining 27 mm. long, 10 mm. wide, minutely and dispersedly nigro-punctate, rounded to subcordate at base, obtuse to retuse at apex, green above, subglaucous beneath. Flowers laxly disposed, about 1 cm. across, yellow. Capsule ovoid-conical, tapering above, about 8 mm. long. Seeds oblong, about $\frac{2}{3}$ mm. long, minutely trabeculate, yellowish-brown.

Hab. Prov. SURUGA: Mt. Fuzi (*R. Yatabe* and *J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, July 25, 1881; *T. Makino!* Aug. 15, 1899); Prov. SHIMOTSUKE; Nikkō (*T. Makino!* Aug. 1903).

This differs from the type by its numerous stems.

Aster trinervius Roxb. **var. viscidulus** Makino var. nov.

Aster Maackii Maxim in litt. non Regel.

Perennial, attaining about 5 decim. in height; roots dense, fibrous. Stem solitary or few-fasciculate, simple, erect, slender, flexuous, striate, pubescent; internodes shorter than leaves. Leaves sparse on stem throughout excepting the base, erect-patent or spreading, sessile, lanceolate,

linear-lanceolate, or ovato-lanceolate, acuminate, obtuse or rounded-obtuse at base, remotely mucronato-serrate, scabro-pubescent and green above, thinly pubescent and often very minutely glandular and paler beneath, triplinerved below, 2–8 cm. long, $\frac{1}{2}$ –2 cm. wide; veinlets numerous reticulated. Cyme terminal, pauci-pluri-cephalous (2 to 10 in number), sometimes monocephalous; branches loosely disposed, simple, gracile, pubescent; bracts similar to leaves; bracteoles similar to leaves in form but smaller or much so, loosely placed, the uppermost one situated close the head. Head 2–2 $\frac{1}{3}$ cm. across, whitish or cæruleo-lilac. Involucre semispherical, rounded-obtuse at base, about 5–6 mm. across; involueral scales depressed-imbricated, glabrous, darkish-viridescent-purpurascens and viscid above, subscarios towards the margin, 1-nerved, obtuse at the apex, the outer ones ovato-oblong, the middle ones oblong to narrowly oblong, the inner ones longer than the rest, linear-oblong, attaining about 5mm. long. Ray-flowers pistillate, patent, rather many: corolla about 9–12 mm. long; ligule narrowly oblong to linear-oblong, 5–7-nerved, rounded and minutely 3-dentate at apex; tube short. Disk-flowers hermaphrodite, numerous, yellow: corolla about 3mm. long; throat campanulate; lobes 5, recurved, narrowly deltoid, acute. Anther often slightly exerted, longer than the filament, connective-tip ovato-deltoid. Style exerted; arms lanceolate and acutish in the ray-flower, but subulato-lanceolate, acute and hairy above in the disk-flower. Pappus longer than the corolla-tube, scabrous. Ovary narrowly obovoid-oblong, pubescent above. Achene narrowly obovoid, compressed or trigonous, smooth, pubescent above, 2 $\frac{1}{2}$ –3 mm. long; pappus longer than the achene, pale-purpurascens when dried.

Hab Prov. SAGAMI: Mt. Komagadake in Hakone (*T. Makino!* Sept. 15, 1886); Prov. ECHIGO: Mt. Shimidzu-tōge (*T. Makino!* Sept. 1888); Prov. SHIMOTSUKÉ: Nikkō (*T. Makino!* Aug. 29, and Sept. 1901, Aug. 1903); Prov. KAI: Mt. Shichimen (*T. Inui* and *P. Ashizawa!* herb. Sc. Coll Imp. Univ. Tokyo, July 28, 1895).

***Abelia spathulata* Sieb. et Zucc. var. *sanguinea* Makino** in Bot. Mag., Tokyo, XII. (1898) p. 17.

A shrub, attaining about 2mm. or more in height; branches terete, ferrugineo-castaneous, castaneous, or griseo-umber, glabrous; branchlets slender, glabrous. Leaves opposite, very shortly petiolate, ovate or elliptical-ovate, attenuatedly long-acuminate, laxly pauci-pluri-depressed-mucronato-serrate, green and thinly pubescent above, paler and pubescent along the midrib

below and often thin-pubescent on the midrib above and veins and veinlets beneath, ciliated, often margined with purple, 1-7 cm. long, $\frac{2}{3}$ -3 cm. broad; veins few or sometimes several on each side, the stronger veins issued from the lower part of the midrib, veinlets numerous reticulated beneath. Flowers geminate at the top of the very short peduncle but often solitary by the arrest of one flower; peduncle shorter than petiole, terminal on branchlets of this year, usually puberulent, $\frac{1}{2}$ -1 $\frac{1}{2}$ mm. long; bracts 6, minute, situated at the top of the peduncle, ovate to ovato-oblong, acute, thicker below, thinly pubescent and ciliated. Calyx 5-divided; lobes patulous, spathulato-oblong, attenuated below, rounded at apex, entire, thinly chartaceous, often thinly pilose externally, but glabrous internally, ciliated, light green shaded with reddish colour, with delicately reticulated and reddish veins, the superior 3 4-6 mm. long, the lower 2 very slightly larger and 5- nearly 7 mm. long in flower, persistent. Corolla campanulato-infundibuliform, roseo-sanguineous, much longer than calyx, $1\frac{1}{3}$ -2 $\frac{1}{3}$ cm. long, thinly puberulent with minute short glandular hairs externally, the lower portion abruptly contracted into a narrow straight tube, the upper portion white on the lower surface internally with reticulated orange veins; limb sub-bilabiate, somewhat obliquely 5-lobed, very minutely ciliated, the upper 2 lobes rounded; the lower 3 lobes ovato-rounded, villose with white hairs internally, the mid-lobe produced and larger. Stamens included, inserted to the corolla-tube, the upper 2 longer; filament filiform, white, thinly and minutely pilose; anther oblong, introrse, white, adnate, bifid at the base. Ovary inferior, narrowly cylindrical, minutely striate longitudinally, longer than the calyx, but shorter than the corolla, light green, minutely pilose, 6-10 mm. long; style erect, straight, nearly equal to the corolla in height, slightly exceeding stamens, filiform, thinly pubescent; stigma terminal, orbicular, depressed-capitate. Gland minute, short and broad, retuse at the apex, yellowish. Flowers in May-June.

Hab. Prov. SHIMOTSUKE: Hosoo-mura (Herb. ! Sc. Coll. Imp. Univ. Tokyo, June 11, 1878), Nikkō (*T. Makino* ! June 1901); Prov. MUSASHI: Mt. Bukō (*K. Watanabe* ! May 28, 1895), Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino* ! May 1891).

This variety is common in Nikkō. The typical one has the yellow or pale yellow flower, and is widely distributed over Japan.

Orchis pauciflora Fisch. ex Lindley; Komar. Fl. Manshur. I. (1901) p. 510.

Gymnadenia pauciflora Lindl. Gen. et Sp. Orchid. p. 280; Ledeb. Fl. Ross. IV. p. 66; Korshinsk. Pl. Amur, in Act. Hort. Petrop. XII. p. 396.

Orchis Joo-Iokiana Makino in Bot. Mag., Tokyo, XVI. (1902) p. 57.

Tubers 2 (erroneously "single" in Bot. Mag., Tokyo, XVI. p. 57), ellipsoid or ovoid, about 10–15 cm. long, one older and much larger than the younger one. Flowers 2–15; bracts sub-foliaceous, viridescens tinged with purple. Labellum rubro-violet as are sepals and petals, white and dispersed with purple spots in the basal portion, pubescent with short hairs towards the base on the upper surface. Calcar stout, equal to or longer than the ovary, rubro-violet.

Hab. Prov. SHINANO: Mt. Togakushi (*R. Yatabe* and *J. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, July 12, 1884; *S. Ikeno*! July 20, 1892); Near Honzawa in Mt. Yatsugadake (*Y. Yabe*! herb. ibid. Aug. 19, 1902); Prov. SHIMOTSUKE: Mt. Nyohō in Nikkō (*K. Jō* and *B. Joki*! July 1900; *T. Makino*! Sept. 7, 1901; *H. Takeda*! herb. ibid. July 20, 1902), Mt. Akanagi in Nikkō (*K. Jō*! July 25, 1902).

Distrib. Irkutsk, Dahuria, Amur-land, and Manshuria.

Cymbidium nipponicum (Frauch. et Sav.) Makino.

Bletia nipponica Franch. et Sav. Enum. Pl. Jap. II. (1879) p. 511.

Cymbidium pedicellatum Finet in Bull. Soc. Bot. d. France XLVII. (1900) p. 268, tab. IX. A.

A terrestrial perennial aphyllous Orchid, attaining about 16 cm. in height. Rhizome obliquely ascending or perpendicular, hypogæous, terete, more or less thick, white when recent, with nodes, internodes about 7–15 mm. long. Scape erect, colourless when recent, terete, glabrous, the base sometimes covered with scales; scales membranaceous, adpressed, many-nerved, acute or mucronato-obtuse, colourless when recent, basal ones lato-ovate, sometimes imbricated, middle ones more or less remotely placed, longer and vaginate below, attaining about 18 mm. long, upper ones remote, ovate and evaginate, embracing. Raceme erect, laxly 1–5-flowered; rachis attaining 5 cm. long, straight or somewhat flexuous, glabrous; bracts erect-patent, subulate to subulato-ovate, elliptical-ovate or elliptical, acute, membranaceous, colourless when recent, many-nerved, embracing, 3–13 mm. long. Flowers medium-sized, pedicellate, erect-patent; pedicel slightly longer than bracts. Sepals free, semi-patent, equal in form, linear-lanceolate or lato-linear, acute, 5–7-nerved, entire, pale when recent; the upper one slightly longer, 20–26 mm. long, 5 mm. wide; lateral ones 20–23 mm. long, 5 mm.

wide. Petals free, shorter than sepals, pale with longitudinal large purple lines sometimes mixed with a few blotches, erect, parallel to the gynostemium, angustato-elliptical or subrhomboid-oblong, acute, scarcely oblique in form, sometimes with a narrow elevated line in centre in the lower half. Labellum, erect, shorter than sepals and petals, sessile to the very base of the gynostemium, 16-18 mm. long, subcarinate, elliptical and entire-margined in the lower half, cuneate towards the base, sub-3-lobed, purple excepting the upper and middle portions, the mid-lobe deltoid-ovate, acute, entire, about $\frac{1}{2}$ of the whole length of labellum, the lateral lobes very small and slightly distinct, calli two, subparallel, with a deep subsaccate-groove between them, slightly elevated above and obtuse at the front end. Gynostemium erect, shorter than the labellum, lato-linear, often more or less thick at apex, 12-14 mm. long, hardly arcuate, sessile, compressed-subsemiterete, carinate, pale and with light purple colour towards the edges and often with thinly dispersed light purple spots on the front surface, very sharply acute and very narrowly marginate on edges, slightly convex on the front surface. Anther terminal, depressed, reniform, emarginate in front, retuse in the posterior, convex, minutely dense-papillose on surface, 2-celled, thick-walled, yellow; pollinia 4, sessile, obovoid, 2-collected in each cell, waxy, pale-yellow, retinaculum thin; clinandrium truncate, perpendicular, broadly triangular, slightly subangulate-convex longitudinally in centre, the posterior margin raised; rostellum shortly projecting. Stigma transverse, angustate, closely placed under the clinandrium. Ovary hardly arcuate, narrowly cylindrical, glabrous, 23-30 mm. long including the pedicel. Capsule..... Flowers in June-August.

Nom. Jap. *Maya-ran*.

Hab. Prov. SETSU: Mt. Maya (Herb. ! Sc. Coll. Imp. Univ. Tokyo, 1879); Prov. SAGAMI: Inamuragasaki (*Y. Asahina* ! July 22, 1902); Prov. KADZUSA: Nagakura in Ōfusa-mura (*W. Yamada* ! Aug. 1902), Ichinomiya (*M. Taguchi* ! herb. *ibid.*, Nov. 4, 1903).

This Orchid is found on hills or in fields not too far from sea.

Eleocharis (*Limnochloa*) **fistulosa** Link 'Jahrb. III. (1820) p. 78'; Schultes in Rœm. et Schultes Syst. Veg. II. Mant. (1824) p. 89; Kunth Enum. Pl. II. p. 155; Steud. Syn. Cyp. p. 80; Miq. Fl. Ind. Batav. III. p. 302; Clarke in Hook. fil. Fl. Brit. Ind. VI. p. 626, et in Journ. Linn. Soc. XXXIV. p. 48.

Heleocharis fistulosa Beck. in Linnæa XXXVI. p. 472; F. Muell. Fragm. Phytogr. Austral. VI. p. 93, et VIII. p. 472; Benth. Fl. Austral. VII. p. 293.

Scirpus fistulosus Poir. Encycl. Meth. VI. p. 749; Rœm. et Schultes Syst. Veg. II. p. 127; Spreng. Syst. Veg. I. p. 205.

Limnocharis fistulosa Nees in Linnæa IX. p. 294.

Scirpus acutangulus Roxb. Fl. Ind. I. p. 213; Spreng. l. c.

Eleocharis acutangula Schultes l. c. p. 91.

Limnochloa acutangula Nees in 'Wight Contrib. p. 114', et in Linnæa IX. p. 294.

Scirpus medius Roxb. l. c.

Eleocharis media Schultes l. c. p. 91; Steud. l. c. p. 81.

Limnochloa media Nees ll. cc.

Eleocharis planiculmis Steud. l. c. p. 80; Zolling. Syst. Verz. Ind. Archip. I. p. 62; Miq. l. c. p. 301.

Scirpus angulatus Willd. herb. 1196, ex Kunth l. c.

Stoloniferous; roots fibrous. Stems pauci-pluri-fasciculate, attaining about 37 cm. long (in my specimen), about $3\frac{1}{2}$ mm. in diameter, not transversely septate, triquetrous with smooth acute edges, smooth; basal vaginæ thinly membranaceous, fistulose, obliquely truncate, acute at the apex, the uppermost one longer and attaining about 9 cm. long. Spicula terminal, solitary, erect, about as broad as the stem, narrowly cylindrical, gradually narrowed above with an acute apex, many-flowered, viridescent, 16–20 mm. long; rachilla glabrous; basal scale 1, erect, shortly vaginate at base, angulate at apex, carinate dorsally, chartaceous, but membranaceous on margin, many-nerved, green. Glumes rather laxly imbricated, erect, herbaceo-subrigid, concave, finely striate when dry, often very obscurely carinate, lato-ovate, muticous, rounded-obtuse and entire or minutely obscurely erose at apex, narrowly scarious towards margin, smooth-margined, punctate with minute ferruginous spots and obscurely sub-numerous-nerved towards the centre, stramineo-viridescent, opaque, the midrib distinct and disappears before reaching the apex. Setæ 6, pale-stramineous, unequal in length, some slightly longer and some slightly shorter than the caryopsis, retrorsely scabro-spinulose. Stamens 3; filament membranaceo-filiform; anther linear, acute at apex. Style long, exserted, 3-fid, ferruginous, about 7 mm. long, the main portion filiform, pubescent towards the top; arms shorter than the main portion, filiform, puberulent. Caryopsis nearly as $\frac{1}{2}$ glume, nearly 2 mm. long, biconvex, lato-obovoid, stramineous, the outermost cells transverse-oblong, arranged in many longitudinal series; style-base shorter than

the caryopsis, deltoid-conical, flat, with a raised annular truncate base, brunnescent.

Nom. Jap. *Misumi-i* (nov.).

Hab. CHIKUZEN in Kiusiu: Near Fukuoka (*Kikuzirō Nagano!* July-Aug. 1894).

New to Japanese Flora.

Eleocharis (*Eleocharis propria*) **nipponica** Makino sp. nov.

Perennial, densely caespitose, attaining 22 cm. in height, glabrous; roots fasciculato-fibrous. Stems erect, gracile, strict, terete but 5-7-striate, attaining about $\frac{4}{5}$ mm. in diameter, green; vagina angustato-terete, fistulose, membranaceous, obliquely truncate, with a mucronate point, 5-7-nerved, often purpurascens below, $1\frac{1}{2}$ -4 cm. long; basal scales few, short, very thinly membranaceous. Spicula terminal, solitary, erect, linear-cylindrical to oblong-linear, acuminate, 7-17 mm. long, $1\frac{1}{2}$ - $2\frac{1}{2}$ mm. across, purpurascens, sometimes proliferous at base; rachilla glabrous; basal scale thinly membranaceous, pellucid towards the margin, elliptical to oval-ovate, rounded or emarginate at apex, embracing, trinerved and viridescent in centre (nerves close and connate above), obscurely carinate, about 3 mm. long. Glumes imbricated, erect, ovato-elliptical, rounded or rounded-obtuse at apex, membranaceous, ferrugineo-purpurascens above, very thin and diaphanous below and towards the entire margin, concave, not keeled, about $2\frac{1}{2}$ -3 mm. long; midrib rather strong, viridescent, stopping before reaching the apex, nerveless on both sides. Setae 6, slightly exceeding the beak (style-base) in height, or lower than it, setaceous, subrigid, retrorsely spinulose, ferrugineous, or pale. Stamens 3; filament filiform, lower than the style; anther linear, minutely mucronato-acute, about $\frac{4}{5}$ mm. long. Style slightly exerted, deeply 3-fid, much dilated at base, brunneo-ferruginous; arms recurved, about as long as the main portion (except the basal dilated portion), puberulent. Caryopsis shorter than glumes, lato-obovoid, compressed-trigonus, yellowish, very minutely foveolato-punctate under lens, about $1-1\frac{1}{3}$ mm. long; style-base ovato-triangular or oblong-conical, compressed-triquetrous, ferrugineo-punctate or pale, nearly as $\frac{1}{2}$ caryopsis or nearly as long as it.

Hab. Prov. SAGAMI: Side of Lake Ashi on Mt. Hakone (*T. Makino!* Sept. 15, 1886); Prov. SHIMOTSUKE: Akanuma-no-hara on Mt. Nikkō (*T. Makino!* Sept. 1903).

Rare; it is found growing in mountainous districts,

Eleocharis (*Eleocharis propria*, Leiocarpice) **liukiensis** Makino sp. nov.

Cespitose, attaining about 3 decim. high; roots fasciculato-fibrous. Stems many, erect, slender or rather stout, with many striations and nearly terete, not angulate, not transversely septate, attaining about $2\frac{1}{3}$ mm. in diameter; the uppermost vagina membranaceous, tubular, closely adpressed, attaining 4 cm. long, 8-9-nerved. minutely ferrugineo-punctate, sub-obliquely truncate, with an erect acumen $\frac{2}{3}$ - $1\frac{1}{3}$ mm. long; basal scales short, membranaceous. Spicula terminal, erect, cylindrico-oblong, acutish, many-flowered, 12-15 mm. long, 4-5 mm. across, viridescent-ferruginous; rachilla glabrous. Basal glume suberect, embracing, ovato-oval, rounded at apex, scarious towards margin, viridescent and ferrugineo-punctate towards the centre, closely 3-nerved in centre, 3 - $3\frac{1}{2}$ mm. long. Glumes many, imbricated, suberect, oval-elliptical, muticous and rounded at apex, thinly membranaceous, hyaline on lower both sides and towards the entire margin, ferruginous above, dispersedly ferrugineo-punctate towards the green centre, about $4\frac{1}{2}$ mm. long, midrib disappears before reaching the apex, otherwise nerveless. Setæ 6, exceeding the caryopsis and about equal to the style-base in height, ferruginous, subrigid, densely plumose with retrorse-patent ferruginous hairs. Stamens 3; filament filiform, longer than setæ; anther linear, acute at apex. Style exerted, ferruginous, deeply 3-fid; arms filiform, puberulent, longer than the glabrous main portion except the dilated base. Caryopsis obovoid, rounded and closely applied to the style-base at apex, shortly attenuated at base, compressed-trigonous, griseo-stramineous or stramineous, very finely striate and marked with longitudinal-oblong pits between striæ under lens, slightly wider than the style-base, $1\frac{1}{2}$ mm. long; style-base large, slightly longer than the caryopsis, angustately deltoid-ovate, acute-acuminate, compressed, ferrugineo-striato-punctate, albido-pulvereo-puberulent except the apex.

Hab. LIUKIU: Isl. Okinawa (*Yasusada Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, April 1887).

This seems to come near to *Eleocharis tetraquetra* Nees, but stouter, and also to *E. cylindrostachys* Boeckel.

Scirpus (*Scirpus proprius*) **nipponicus** Makino in Bot. Mag., Tokyo, IX. (1895) p. 311.

Perennial, attaining $10\frac{1}{2}$ decim. in height, flaccid, quite glabrous, standing in water; roots fibrous. Rhizome horizontally repent, slender,

white, soft; nodes remote, with a sheathing membranaceous scale at each node. Leaves few, erect, sheathing towards the base (the sheath not connate and thinly membranaceous), elongate, slender, triquetrous with smooth edges, acute at apex, smooth, green, $1\frac{1}{2}$ –5 mm across, shorter than the stem. Stem solitary, erect, slender, very acutely triquetrous with smooth edges, smooth, green, aphyllous, the base enclosing by the lower portion of leaves. Inflorescence pseudo-lateral, sessile, much shorter than the bract, loosely and divaricately few-branched, 3–8–spiculose, simply raceme-like or compound; rachis short, geniculate, triquetrous, not scabrous, branches often binate (the inferior one longer) to a joint of the rachis, unequal in length, compresso-triquetrous, attaining 4 cm. long, the superior ones shorter; bracteoles subulate, carinate dorsally, mostly thin-membranaceous, the inner one thick and gibbose at the base, the longest one attaining 22 mm. in length; bract continued to the stem, erect, slender, acute, triquetrous, not scabrous, green, about 10–19 cm. long. Spiculæ ovato-cylindrical or cylindrico-fusiform, acutish on both ends, 10–16 mm. long, many-flowered, bay-ferruginous, pedicellate and mixed with sessile ones; rachilla glabrous. Glumes imbricated, ovato-lanceolate, acute or obtuse or emarginate and with a minute mucronate tip which is the apical end of the midrib, ciliolate on margin, membranaceous, fulvo-ferruginous, but green in the midrib, nerveless on sides of the midrib, concave, ecarinate, $5\frac{1}{2}$ –6 mm. long. Setæ 4, twice or a little more as long as the caryopsis, somewhat unequal in length, erect, setaceous, tapering, rigid, spreadingly spinuloso-pubescent, fulvous. Stamens 2; filament filiform, exceeding the glume, glabrous; anther lato-linear, mucronate at apex, 2 mm. long. Style long, filiform, exerted, deeply bifid; arms slightly shorter than the main portion, filiform, obscurely puberulent. Caryopsis stramineous, lato-obovoid, shortly attenuated at the base, compressed with obtuse edges, smooth, 2 mm. long, cuspidately beaked with the base of the style, the beak about $\frac{1}{2}$ mm. long.

Nom. Jap. *Shidzu-i* (T. Makino).

Hab. Prov. IWAKI: Takamatsu in Yawata-mura, Uta-gōri (*T. Makino!* Aug. 16, 1890); Prov. SHIMOOSA: Mama (*T. Makino!* August 1893).

Rather rare.

Symplocos paniculata (Thunb.) Wall. 'Catal. (1828) n. 4429.'

Prunus paniculata Thunb. Fl. Jap: (1784) p. 200.

Symplocos cratægoides Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. (1825) p. 145.

var. glabra Makino var. nov.

A shrub, densely ramose; branches fulvo-isabel-coloured, slightly flexuous, terete. Leaves alternate, shortly petiolate, elliptical or obovato-elliptical, shortly acute-acuminate, usually acute at base, serrate with mucronato-acute teeth, chartaceo-membranaceous, nearly concolorous, but sometimes subglaucous beneath, glabrous but slightly puberulent in axils of veins and along the midrib or sometimes ciliated on margin, 2-6 cm. long, $1\frac{1}{3}$ -3 cm. broad; midrib and veins prominent beneath and the latter 4-5 on each side, with numerous reticulated inconspicuous veinlets; petiole glabrous, 3-7 mm. long. Cymes compound forming a small ovato-oblong panicle (about 5-11 cm. long), terminating a short glabrous lateral branchlets (of this year) which are foliiferous below, glabrous; rachis gracile, flexuous, branches loosely disposed, short, erect-patent or patent, about 2-9-flowered. Flowers white, about 7mm. across, jointed with the pedicel; pedicel short, gracile. Calyx-lobes 5, patent, small, ovato-elliptical, or deltoid-ovate, obtuse, glabrous but ciliate, thickish, slightly concave, few-nerved, about 1 mm. long. Petals 5, patent, ovato-elliptical, rounded at apex, entire, often ciliate above, 5-7-nerved, $3-3\frac{1}{2}$ mm. long, $2-2\frac{1}{2}$ mm. wide. Stamens numerous, sub-5-delphous, equal to petals in length, glabrous; filaments filiform, tapering at apex; anther ovoid to lato-ovoid, minute. Style 1, erect, scarcely lower than stamens, filiform, glabrous; stigma subbilobed; ovary small, obconical, glabrous. Fruit shortly ovoid, scarcely oblique, black (not blue) when matured, 5-7 mm. long. Flowers in May.

Hab. Prov. MINO: Kamikanō-mura (*K. Mori!*); Prov. MIKAWA: Uyeno (*G. Nagura!*), Takashi-mura (*T. Makino!* Oct. 25, 1893, Oct. 29, 1824).

This is found in Middle Japan. Miquel's *Symplocos paniculata* β. *parvifolia* probably belongs to this.

Arabis (*Euarabis*) **iwatensis** Makino sp. nov.

Perennial, laxly caespitose, attaining about 5 cm. high in flower, but about 8 cm. high in fruit. Leaves thickish, dispersed and ciliated with rigid bi-furcate erect hairs mixed with simple ones, the under surface very thinly dispersed with simple and bi-furcate minute hairs, green, concolorous; rosulate leaves patent, petioled, orbiculate or lato-orbiculate, rounded at the apex, suddenly reduced and slightly decurrent to the petiole at the base, 1-3-angulato-dentate on each side or subentire, 6-11 mm. long, 6-12 mm. broad; petiole shorter or sometimes longer than the blade,

1-17 mm. long, thinly ciliated; cauline leaves 2-3, remotely placed, sessile, semi-amplexicaul or amplexicaul, elliptical or ovato-elliptical, obtuse, one-several-denticulate on each side, 8-12 mm. long, 7-9 mm. wide. Stem erect, gracile, pubescent with bi-furcate and simple hairs, purpurascens below when recent. Raceme sub-nutant, several-subnumerous-flowered; rachis minutely puberulent below; pedicel glabrous, shorter than the flower. Flower white, 8-10 mm. across. Sepals oblong or elliptical, obtuse, glabrous, yellowish viridescent, loosely and delicately anastomosing nerved, nearly 3 mm. long, the lateral ones much concave. Petals exerted, patent and then reflexed above, narrowly oblong, retuso-emarginate, cuneate at the base, about $5\frac{1}{2}$ mm. long. Stamens longer than sepals; filament subulato-filiform, glabrous; anther linear-ovate, 1mm. long. Pistil shorter than stamens; ovary linear, terete, glabrous, about 2 mm. long; style very short, erect; stigma convex-truncate, shallowly 2-lobed. Silique linear, about 18 mm. long, glabrous, with a very short persistent style and a pedicel about 7 mm. long; valves membranaceo-subcoriaceous, sub-3-nerved. Seeds in one row, ellipsoid or oblong, slightly winged on margin, $1\frac{1}{3}$ -2mm. long.

Hab. Prov. SHIMOTSUKE: Nikkō, cultivated by B. Ioki from Mt. Iwate in the province of Rikuchū, collected by K. Jō (*T. Makino!* 1902, fruit, May 1, 1904, flower).

Acer Miyabei Maxim. in *Mél. Biol.* XII. p. 725 (1888); Sargent *For. Fl. Jap.* p. 29, tab. 9; Pax *Acerac.* in Engler's *Pflanzenreich*, IV. 163, p. 53.

Hab. HOKKAIDŌ [YEZO] (*K. Miyabe!* *Y. Tokubuchi!* *H. Yabe!* *J. Veitch!*); Prov. RIKUCHŪ in Honsiu: Goshō-mura in Iwate-gōri, spont. (*G. Yamada!* no. 110, July 12, 1903).

It is interest that this species appeared in Honsiu, because, besides Hokkaidō (Yezo), the other locality of the species was hitherto unknown to us; in Honsiu it was discovered and collected by Prof. Gentarō Yamada, who kindly sent me the specimen.

Acer pictum Thunb. var. **dissectum** Wesmél subvar. **subtrifidum** Makino nov.

A small tree. Leaves long-petiolate, deeply palmato-5-7-parted, usually with a widely open sinus or truncate sometimes cuneato-truncate

at base, green and glabrous above, paler and white-pubescent on nerves beneath, 4-14 cm. long, 5-18 cm. wide; lobes ovato-lanceolate, oblong, obovato-cuneate, caudately acuminate, entire or bifid or trifid; lateral lobules deltoid or angustato-deltoid and obtuse or sharply pointed, smaller and shorter than the mid-lobe; petiole usually longer than the blade, attaining about 19 cm. in length. Flower..... Fruit.....

Nom. Jap. *Yaguruma-kayede* (nov.).

Hab. Prov. MUSASHI: Mt. Takao (*T. Makino!* Nov. 1903); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cultivated (*T. Makino!* June 1904).

***Acer japonicum* Thunb. var. *Heyhachii* Matsum.**

Acer Heyhachii Matsumura in sched. herb. Sc. Coll. Imp. Univ. Tokyo.

A shrub. Leaves very deeply 9-13-parted, orbicular in outline, 5-12 cm. in each way, deeply cordate at base; lobes narrowly long-attenuated and entire below, the upper portion ovate or ovato-lanceolate acuminate, deeply pinnato-incised, the lacinae deltoid-ovate or narrowly triangular-ovate, sharply inciso-serrate and sharply pointed, thinly tomentose towards axils of veins beneath and nearly glabrate above in the young one, the lowest lobe smallest; petiole shorter than the blade, villosa-tomentose above. Flower purple, about 8-10 mm. across; stamens much exerted, with glabrous anthers; pistil tomentose. Fruit widely divaricate, wings oblong-spathulate, about 2 cm. long.

Nom. Jap. *Maikuzyaku*.

Hab. Prov. OWARI: Nagoya, cult. (*T. Makino!* Aug. 1899); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino!* May 1899, Nov. 1899, June 26, 1900).

Undoubtedly a garden variety.

***Ardisia* (Crispardisia) *hortorum* Maxim. in Regel's Gartenfl. (1865) p. 363, tab. 491.**

Ardisia Tachibana Makino Notes on Jap. Pl. XV. in Bot. Mag., Tokyo, VI. (1892) p. 53, nomen tantum.

Ardisia crispa Le Maout et Decne. Gen. Syst. Bot. trans. Hook. (1876) p. 532, figg., non A. DC.

An undershrub, attaining about 5 decim. in height; stem erect, usually simple, or sometimes few-branched, terete, often dispersed with lenticels,

with leaf-scars, brown and glabrous, but minutely glandular in young portion of this year. Leaves persistent, spreading, sparse, crowded at the top of the stem, petiolate, elongato-lanceolate or lato-lanceolate, gradually attenuated-acuminate with an obtuse and subcallose tip, cuneato-attenuated below, depressed-subcrenate-subcrisped or subentire, with an intramarginal series of small distinct acute processes on the upper surface and convex spots on the under surface, flaccidly chartaceo-membranaceous, or membranaceous, glabrous, deep-green above, light green and inpunctate beneath, 8-24 cm. long, $1\frac{2}{3}$ -7 cm. broad, involute in veneration; midrib much prominent beneath and very angustately prominent above; veins usually 4-7 on each side, ascending and often subparallel to the midrib, curved inwards at base and curved outwards at apex; veinlets inconspicuous; petiole flatly grooved in front, glabrate but minutely glandular when young, 6-13 mm. long. Inflorescence much shorter than leaves; umbels pedunculate, cernuous, shorter than peduncles, 4-12-flowered to an umbel, $2\frac{1}{4}$ - $2\frac{2}{3}$ cm. across, usually simple, or sometimes compound with short second peduncles; pedicels proportionally stout, terete, straight or slightly curved downwards at the upper end, purpureo-rosy, very minutely glandular, 5-10 mm. long, the surrounding ones erect-patent; peduncles approximate, axillary to leaves of the stem of the last year and to fallen scales (which are subulate, subulato-lanceolate, subulato-linear, or spatulate, 8-11 mm. in length) in the basal portion of stem of this year, erect-patent, terete, very minutely glandular, straight but curved downwards at the top, 2-5 cm. long; bracts caducous, very loosely sparse on the peduncle, subulate, linear to oblong-linear, or linear-spatulate, obtuse or acutish, thickish, punctate and minutely glandular externally, about 5-10 mm. long, sometimes the superior 1 or rarely 2 developed into the leaf and attaining about 9 cm. long; bracteoles placed at the base of pedicels, caducous, subulate to subulato-oblong, usually obtuse, concave, thick, minutely glandular externally, punctate, greenish, 3- $4\frac{1}{2}$ mm. long. Flower white, inodorous, 9-10 mm. across. Calyx deeply 5-parted, spreading, but erect after flower, glabrous, shorter than the corolla; lobes oblong or narrowly oblong, obtuse, entire, 2- $2\frac{1}{3}$ mm. long, pale rose below and light green above. Corolla deeply 5-parted, campanulato-rotate, revolute above, glabrous, inpunctate, thickish, deciduous; lobes oblong-ovate, acute, entire, $2\frac{1}{2}$ -3 mm. across, covered with minute papilloso-glandular below internally under lens. Stamens erect, shorter than the corolla, inserted to the base of the corolla, glabrous; filament very short, subulate; anther connivent, deltoid-lanceolate, acute, bi-auriculate with acutish lobes at base, introrse,

basifixed, about $3\frac{1}{2}$ mm. long, yellow but fulvous after bursting. Ovary ovoid-globose, smooth, glabrous, punctate, viridescent, about $1\frac{1}{4}$ mm. across, 1-celled, sub-several-ovuled; style erect, filiform, glabrous, slightly exceeding stamens, about 4 mm. long; stigma terminal, not thick. Fruit red, globose and hardly depressed, minutely concave at top, smooth, shining, with the reflexed persistent calyx at base, 1-seeded, 9 mm. across; pedicel 6–11 mm. long; peduncle attaining about $7\frac{1}{2}$ cm. long. Flowers in July.

Hab. TOKARA ARCHIP.: Isl. Naka-no-shima, spont. (*Y. Tashiro!* 1890); Prov. TOSA: Sakawa, cult. (*T. Makino!* 1897); Prov. HIGO: Kurokami-mura in Hōtaku-gōri, spont. in Bamboo grove (*H. Nakagawa!* Nov. 29, 1897); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 23, 1883), and cultivated from Mt. Kiyosumi, prov. Awa=Bōshū (*T. Makino!* July 1904).

This is allied to *Ardisia crispa* A. DC. (= *Bladhia crispa* Thunb.), but differs apparently from it, by much narrower and inpunctate leaves; scale (caducous)-bearing and often leafless peduncles; shorter and stouter pedicels; usually simple umbel (though sometimes is compound). This is found growing wild in wooded places in middle and southern Japan, but it is also cultivated; under the cultivation there are various garden forms. The specimen from Tokara Archipelago, collected by Mr. Yasusada Tashiro as quoted above, is sufficiently developed having the much broader leaves.

Scirpus (Silvaticæ) **karuisawensis** Makino sp. nov. (Photogr. 1.)

Perennial, attaining about 1 m. or more in height; rhizome very short; roots fibrous, dense, with many short rootlets. Leaves angustato-linear, long-acuminate, triquetrous towards the acutish or subobtusate apex, glabrous, but serrulato-scabrous on margin, rigid; radical ones copious and densely caespitose, shorter than the stem, finely striate below, clasping and evaginate below; cauline ones erect, remote, attaining about 5 mm. in width, serrulato-scabrous on the midrib beneath, vaginate at base, the vagina attaining 7 cm. long and truncate at the mouth, the uppermost leaf exceeding the panicle. Stem erect, straight, slender, attaining about 4 mm. in diameter at base, smooth, shining, subtrigono-terete with obtuse angles, nodes not prominent. Cymes compound and forming an elliptical to ovate panicle 4–13 cm. long; the terminal cyme sessile; lateral peduncles (radii) few, erect, unequal in length, the longest one about 8 cm., slender, glabrous, the basal vagina tubular, obliquely truncate, attaining about $1\frac{1}{2}$ cm. long; involucreal leaves 2–3, angustato-linear, long-acuminate, the outer ones

longer than the panicle, erect or suberect, serrulato-scabrous on margin and midrib beneath, the outer ones longer than the panicle, attaining about 19 cm. long; pedicels setaceous, glabrous, erect-patent, unequal in length, few to several in the lateral cymes but several to subnumerous in the terminal cyme; bracts subulato-linear, setaceo-acuminate, scabrous on margin but membranaceo-margined below, attaining about $3\frac{1}{2}$ cm. long. Spiculae about 2-13—aggregate into a subsemispherical head which is 5-10 mm. across and shorter or longer than pedicels, brunneo-ferruginous, sessile, elliptico-obovoid, acutish, 4-5 mm. long, $2\frac{1}{2}$ -3 mm. across; rachilla straight and stout; bracteoles subulate, acuminate, membranaceous on margin, shorter than or equal to heads in length. Glumes dense, imbricated, ovate, acuminate with a sharp point, thinly membranaceous, ferruginous, minutely scabro-spinulose on margin above, concave, subcarinate when dry, $2\frac{1}{2}$ -3 mm. long; midrib not stout, otherwise nerveless. Setae 6, ferruginous, flexuoso-corrugate with two geniculate angles, filiform, scarcely enlarged and scabro-spinulose above, about $4\frac{1}{2}$ mm. long when lengthened. Stamens 2; filament lower than the style, filiform, slightly wider above; anther oblong-linear, acutish at apex, about $\frac{4}{5}$ -1 mm. long. Caryopsis obovoid, compressed-trigonus, shortly attenuated at base, rounded-obtuse and with a gracile beak (style-base) a little shorter than $\frac{1}{2}$ caryopsis, stramineous, smooth, about $1\frac{1}{3}$ mm. long; style $1\frac{2}{3}$ - $2\frac{1}{2}$ mm. long, deeply 3-fid, ferruginous except the subdilated base which is stramineous and formed a beak of the caryopsis; arms setaceous, $\frac{2}{3}$ -1 mm. long, minutely and obscurely scabrous.

Hab. Prov. SHINANO: Karuisawa (*T. Makino!* Sept. 1888).

This grows in the boggy place in Karuisawa plain. It differs from *Scirpus fuirenoides* Maxim. (Photogr. 3.) by the much denser panicle; smaller and more numerous heads; not darkish viridescent spiculae; and smaller ferruginous glumes; from *S. Mitsukurianus* Makino (Photogr. 2.) by the smaller habit; smaller and narrower leaves; smaller stem; smaller and denser panicle; erect radii; smaller and more numerous heads; more loosely notched rachilla; shorter and broader glumes; shorter and stouter setae; and larger caryopsis; and from *S. cyperinus* Kunth and its *varr. Eriophorum, concolor*, and *Wichurui* by the smaller habit; less compound and not effuse panicle; larger and not solitary or not few-aggregate spiculae; much larger glumes; and larger caryopsis.

Scirpus (Silvaticae) **cyperinus** (Linn.) Kunth.

a. normalis O. Kuntze Rev. Gen. Pl. II. (1891) p. 757.

Eriophorum cyperinum Linn. Sp. Pl. ed. 2, I. p. 77; Richt. Cod. n. 442; Willd. Sp. Pl. I. p. 313.

Scirpus cyperinus Kunth Enum. Pl. II. p. 170; Britt. et Br. III. Fl. N. Un. St. et Can. I. p. 271, fig. 636.

Trichophorum cyperinum Pers. Syn. Pl. I. p. 69, excl. syn. Michx.

Eriophorum cyperinum var. *laxum* Wats. et Coult. in A. Gray, Man. Bot. ed. 6, p. 582.

Scirpus Eriophorum var. *cyperinus* A. Gray, Man. Bot. ed. 2, p. 501, et ed. 5, p. 565.

Scirpus Eriophorum β. Bæck. in Linnæa XXXVI. p. 732.

Scirpus thyrsiflorus Willd. herb. n. 1241, fol. 4, ex Kunth l. c.

Hab. North America.

β. **Eriophorum** (Michx.) O. Kuntze l. c.; Britt. 'in Trans. N. Y. Acad. Sc. II. (1892) p. 82'; Britt. et Br. l. c.

Scirpus Eriophorum Michx. Fl. Bor. Am. I. p. 33; Kunth Enum. Pl. II. p. 170; Bæck. in Linnæa XXXVI. p. 731; Roem. et Schult. Syst. Veg. II. p. 147, excl. syn.; A. Gray, Man. Bot. ed. 5, p. 565.

Eriophorum cyperinum Vahl herb. ex Kunth l. c.

Scirpus thyrsiflorus Willd. herb. n. 1241, fol. 1-3, ex Kunth l. c., et Enum. Pl. Hort. Bot. Berol. p. 78, excl. syn.

Panicle decompose, copiously spiculose. Spiculæ 1-4-aggregate, globoso-ellipsoid, 3-4 mm. long. Setæ sometimes not enlarged above and not scabrous or obscurely so (as in those of the American form), but usually slightly enlarged and serrato-scabrous above.

Nom. Jap. *Ezo-aburagaya*.

Hab. Prov. KUSHIRO in Hokkaidō (*K. Miyabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 13, 1884); Prov. OSHIMA: Hakodate (*R. Yatabe!* herb. ibid. Aug. 10, 1878); Prov. IBURI: Tomakomai (*J. Matsumura!* herb. ibid. Aug. 13, 1899); Prov. MUTSU: Tokiwano (*T. Iwakawa!* herb. ibid. July 25, 1880); Prov. SHIMOTSUKE: Nikkō (*R. Yatabe!* herb. ibid. Aug. 3, 1877; *K. Sawada!* herb. ibid. Sept. 29, 1879); Prov. RIKUCHŪ: Near Itsukushi (*T. Makino!* Aug. 1890).

Common in northern Japan. In the Japanese form, the setæ are usually somewhat enlarged and serrato-scabrous above.

γ. **concolor** (Maxim.) Makino.

Scirpus concolor Maxim. in Mém. Biol. XII. p. 556 (1886).

? *Scirpus Eriophorum* Bæck. in Engler's Bot. Jahrb. VI. p. 51, non Michx.

Spiculæ 1-3-aggregate, ovoid-oblong, many-flowered, 6-9mm. in length. Setæ slightly enlarged and serrato-scabrous above.

Nom. Jap. *Abura-gaya*.

Hab. Prov. SAGAMI: Hakone (Herb. ! Sc. Coll. Imp. Univ. Tokyo, Aug. 1880); Prov. SHINANO: Shimo-suwa (*R. Yatabe* and *J. Matsumura* ! herb. *ibid.* July 24, 1880); Prov. IGA: Shōrenzi-mura in Nabari-gōri (Herb. ! *ibid.*); Prov. HITACHI (Herb. ! *ibid.*); Prov. HIZEN: Takeo (*R. Yatabe* and *J. Matsumura* ! herb. *ibid.* July 1882); Prov. SETSU: Mt. Maya (*R. Yatabe* ! Aug. 15, 1888); Prov. MIKAWA: Near Futakawa (*T. Makino* ! Oct. 28, 1894); Prov. KAWACHI: Mt. Kongō-zan (*T. Tada* ! herb. *ibid.*); Prov. SUŌ: Ōuchi-mura (*D. Nikai* ! herb. *ibid.* Aug. 26, 1892); Prov. KŌDZUKE: Yakatahara-mura (*T. Makino* ! Sept. 1888), Yokogawa (*T. Makino* ! Sept. 1888); Prov. TOSA (*S. Yano* ! 1888), Mt. Kuromori (*T. Makino* ! Aug. 1885), Tokano-mura (*T. Makino* ! Aug. 1885); Prov. HARIMA: Mt. Masui (*K. Ikeda* ! 1902); Prov. SHIMOTSUKE: Nikkō (*T. Makino* ! Sept. 1901).

Common in middle and southern Japan.

♂. **Wichurai** (Bœck.) Makino.

Scirpus Wichurai Bœck. in *Linnaea* XXXVI. (1869-70) p. 729; Maxim. in *Mél. Biol.* XII. p. 557.

Scirpus Eriophorum var. *nipponicus* Franch. et Sav. *Enum. Pl. Jap.* II. (1879) pp. 114, 545.

? *Scirpus Eriophorum* Miq. *Prol. Fl. Jap.* p. 75.

Spiculæ solitary, lateral ones pedicellate, ovoid, 4-5 mm. long. Setæ serrato-scabrous and usually slightly enlarged above.

Nom. Jap. *Aiba-sō*.

Hab. Prov. IWASHIRO: Aidzu (*J. Matsumura* ! herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1879); Prov. KAGA: Yumoto in Mt. Hakusan (*R. Yatabe* and *J. Matsumura* ! herb. *ibid.* Aug. 6, 1881); Prov. KŪ: Mt. Zyūdyō-tōge (*J. Matsumura* and *S. Ōkubo* ! herb. *ibid.* July 24, 1883); Prov. TOSA: Mt. Kuromori (*R. Yatabe* ! herb. *ibid.* Aug. 3, 1888); Prov. CHIKUZEN: Mt. Wakasugi (*K. Nagano* ! herb. *ibid.*); Prov. ECHIGO: Mt. Komagadake (*B. Hayata* ! herb. *ibid.* 1903), Mt. Shinidzu-tōge (*T. Makino* ! Sept. 1888); Prov. ISE: Tsu (*B. Kida* ! 1899); Prov. SHIMOTSUKE: Nikkō (*T. Makino* ! Sept. 1901); Prov. MUSASHI: Shirako (*T. Makino* ! Aug. 29, 1894, Sept. 23, 1895); Prov. UGO: Masuta (*I. Satō* ! Aug. 19, 1892).

Common in middle and southern Japan, and southern districts of northern Japan.

Pittosporum illicioides Makino in Bot. Mag., Tokyo. XIV. (1900) p. 31 (Pars 1), et p. 32. (With Figure.)

Inflorescence umbellate on the top of branchlets of this (erroneously "last" loc. cit. p. 33) year, shorter than leaves, laxly 3-10-flowered; pedicels straight, narrow, glabrous, erect-patent or patent in the surroundings, 14-30 mm. long. Flower dioecious, 7-8 mm. long, about 10 mm. across; bud oblong, pale viridescens. Sepals 5, small, erect-patent, sometimes shortly connate at the base, more or less unequal-sized, ovate to lato-ovate, obtuse, thicker towards the centre and base, sometimes ciliated, 2-3 mm. long, pale viridescens. Petals 5, patent then more or less reflexed above, erect as if form a broad tube below, angustato-oblong, somewhat spatulate, rounded-obtuse, entire, about 10 mm. long, $\frac{1}{2}$ -3 mm. broad, thickish, glabrous, yellow but lighter below, vertically 3-nervate below and ramoso-venulose above. Stamens 5, erect, shorter than petals, glabrous, longer than the pistil and 7 mm. long in the male flower, but shorter than the pistil and 5 mm. long in the female flower; filament stout-filiform, longer than the anther, yellow or yellowish-viridescens; anther triangular-ovate and $2\frac{1}{2}$ mm. long in the male flower, but angustato-deltoid and $1\frac{1}{2}$ mm. long and without pollen in the female flower, subobtuse and submucronate at apex, auriculate at base, introrse, yellow; pollen yellow. Ovary ovoid, thinly puberulent, shortly substipitate, about 2 mm. across, pale viridescens; style erect, shorter than the ovary, stout; stigma terminal, depressedcapitate and fulvo-yellow in the female flower, but not capitate and not thick in the male flower. Flowers in May.

Hab. Prov. HARIMA: Mt. Masui and Hiromine (*K. Ikeda!* Oct. 23, 1901), Near Mt. Okishio (*K. Ikeda!* May 25, 1902), Kashima-mura (*U. Ōgami!* May 1904).

I am indebted to Mr. Uchi Ōgami for living specimens of flowers of this rare species.

Malaxis paludosa (Linn.) Sw. 'in Vet. Akad. Nya Handl. Stockh. XXI. (1800) p. 235, tab. 3'; Houtt. Linn. Pfl.-Syst. XI. p. 608; Willd. Sp. Pl. IV. p. 91; Pers. Syn. Pl. II. p. 514; R. Br. in Ait. Hort. Kew. ed. 2, V. p. 208; Spreng. Syst. Veg. III. p. 740; Reichb. Fl. Germ. Excurs. p. 134; Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 604; Lindl. Gen. et Sp. Orchid. p. 24; Ledeb. Fl. Ross. IV. p. 51; Boswell Syme, Engl. Bot. IX. p. 135, tab. 1489; Benth. Handb. Brit. Fl. ed. 5, p. 435; Hook. fil. Stud. Fl. Brit. Isl. ed. 3, p. 384; Ridley in Journ. Linn. Soc. XXIV.

(1888) p. 348; Pfitzer in Engler et Prantl, Nat. Pfl.-Fam. II. 6, p. 129, fig. 128, H, J, K.

Ophrys paludosa Linn. Sp. Pl. p. 947; Richter, Codex, n. 6849; Houtt. Nat. Hist. XXX. (1780) p. 516.

Orchis paludosa Pall. 'Reise III. p. 320.'

Epipactis paludosa F. W. Schmidt, 'in Mey. Phys. Aufsatz, (1791) p. 245.'

Hammarbya paludosa O. Kuntze, Rev. Gen. Pl. II. p. 665.

A little orchid, about 15 cm. or more in height. Pseudbulb ovoid or ellipsoid, green, about 5-6 mm. long, clothed with old soft pale sheaths at base, the younger one encircling with the basal sheath of leaves, a new plant forming at the side of the old. Leaves few, elliptical-obovate to oblong, obtuse, shortly attenuated below, green, with 3 main nerves, the superior ones vaginate at the base, the uppermost one larger and about $1\frac{2}{3}$ cm. long including the petiole, 1 cm. broad. Scape terminal on the pseudbulb, embracing by the vagina of the uppermost leaf, erect, slender, sharply 6-angular, green, glabrous. Raceme erect, slender, spiciform, about 8-9 cm. long, rather laxly many-flowered; rachis straight, sharply angulate, green; bract minute, equal to or a little longer than the pedicel, erect, or erect-patent, ovato-subulate, acuminate, entire, 1-nerved, concave, green, 2-3 mm. long. Flower minute, pedicellate, resupinate, yellowish-green, about 4 mm. in diameter vertically; pedicel erect, twisted, shorter than the flower, but slightly longer than the ovary. Sepals very patent, subequal, free, subherbaceous, entire, 1-nerved; the posterior ones erect, ovate, obtuse, somewhat oblique in form, 2 mm. long; the anterior one turned downwards, oblong-lanceolate, obtuse, 2 mm. long. Petals subherbaceous, much smaller and shorter than sepals, 1-nerved, linear-oblong, long-acuminate with an obtuse or acutish point, entire, abruptly much recurved above, $1\frac{1}{2}$ mm. long. Labellum turned upwards, shorter than sepals, sessile, broadly deltoid-ovate, often very obscurely trilobed below, obtuse or acutish, subcordate and embracing the gynostemium at the base, concave, etuberculate, ecalcarate, subherbaceous, green, 3-nerved, $1\frac{1}{2}$ mm. long. Gynostemium very short, thickish, terete, straight, the clinandrium hollowed and bidentate at the apical edge; anther ovato-deltoid, acutish, situated behind the stigma (which is placed under the rostellum) and sessile at the apex of the hollow of the clinandrium, suberect, persistent, distinctly 2-ocular, dehiscing upwards, the loculament ovato-oblong; rostellum retuse or bifid, erect or suberect. Pollinia 4, incumbent, clavato-oblong, compressed, sessile, waxy, yellow, in 2 pairs, both pairs suspended from a minute gland which terminates the anther. Ovary ellipsoid, about 1 mm. long, viridescent. Capsule ellipsoid-

globose, turgid, 6-sulcate, slightly oblique in form, erect, a little longer than the pedicel, 3 mm. long, with the erect persistent perianth.

Nom. Jap. *Yachi-ran* (nov.).

Hab. Prov. SHIMOTSUKE: in Sphagnum bog in Akanuma-no-hara on Mt. Nikkō (*S. Aisawa*! July 27, 1904).

New to the Flora of Japan, very rare.

Distrib. Central and West Europe: Great Britain, Scandinavia, Russia, Belgium, Holland, Germany, and Austria. North Asia: Siberia (Baikal and Davuria).

Chenopodium (Botrydium) **aristatum** Linn. Sp. Pl. p. 221, et ed. 2, p. 321, excl. β .; Richt. Cod. n. 1815; Hoult. Nat. Hist. XXV. (1777) p. 782, et Linn. Pfl.-Syst. V. p. 814; Willd. Sp. Pl. I. p. 1307; Id. Enum. Pl. Hort. Bot. Berol. p. 291; Pers. Syn. Pl. I. p. 295; Ait. Hort. Kew. ed. 2, II. p. 101; Spreng. Syst. Veg. I. p. 921; Schult. Syst. Veg. VI. p. 264, excl. β ; Ledeb. Fl. Alt. I. p. 410; Bunge, Enum. Pl. Chin. Bor. p. 57, n. 314; Id. Enum. Salsol. Centrasiat. in Act. Hort. Petrop. VI. p. 405; Id. Enum. Salsol. Mongol. in Mél. Biol. X. p. 278; Id. Salsol. Herb. Petrop. in Act. Hort. Petrop. XIII. p. 19; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 324; Volkens in Engler et Prantl, Nat. Pfl.-Fam. III. 1 a, p. 58, fig. 25, C-G; Diels, Fl. Centr.-Chin. in Engler's Bot. Jahrb. XXIX. p. 316.

Atriplex aristata Crantz 'Inst. I. p. 208.'

Teloxys aristata Moq. in Ann. Sc. Nat. 2^{me} Sér. I. p. 290, tab. 10, fig. A; Id. Chenop. Monogr. Enum. p. 16; Id. in DC. Prodr. XIII. 2, p. 59; Fenzl in Ledeb. Fl. Ross. III. p. 693; Bunge in Maxim. Prim. Fl. Amur. p. 222; Maxim. Ind. Fl. Pek. in Prim. Fl. Amur. p. 476, et Ind. Fl. Mongol. l. c. p. 484; Regel, Tent. Fl. Ussur. n. 397; Herder, Pl. Radd. Apetal. in Act. Hort. Petrop. X. p. 584; Korshinsky in Act. Hort. Petrop. XII. p. 380; Franch. Pl. David. I. p. 247; Bretschn. Hist. Eur. Bot. Disc. Chin. pp. 179, 608.

Lecanocarpus aristatus Zucc. 'in Mart. Hort. Monac. (1829) p. 56.'

Chenopodium secundiflorum Viv. 'Fl. Lib. Spec. p. 67.'

Chenopodium foliis ex lineari lanceolatis, racemis conjugatis, dichotomis, nullis, apice setaceis Gmel. Fl. Sib. III. p. 83, n. 65, tab. 15, fig. 1.

An annual herb, much ramose. Stem erect, viridi-striate, papilloso-puberulent; branches erect-patent. Leaves alternate, linear or linear-lanceolate, obtuse or acute, gradually attenuated to a short petiole below, entire,

subcarnose, glabrous, green; midrib distinct; veins inconspicuous. Floriferous branches short, very numerous, erect-patent, divaricately dichotomous, with aristato-cetaceous sterile extreme branchlets, corymb-like, loosely and cymosely disposed with flowers, leafless, angulate, glabrous, viridescent. Flower very minute, axillary, solitary, sessile, subsessile, or very shortly pedicellate, ebracteate. Calyx deeply 5-parted, herbaceous, glabrous, viridescent, persistent; lobes obovate or obovato-elliptical, rounded-obtuse, concave, at length subcarinate dorsally, inappendiculate, the middle green, both sides membranaceous and diaphanous; in fruit erect-patent and incurved holding the fruit, unchanged but slightly enlarged. Ovary included, globose; style 1, erect, very short; stigmas 2, patent, linear, longer than the style. Utricle depressed, about $\frac{3}{8}$ mm. across; pericarp very thin, pale, close to the seed. Seed horizontal, lenticular with the obtuse margin, depressed, smooth, nigropurpurascenscent; testa thin, crustaceous; albumen copious, farinaceous; embryo annular, the caulicle somewhat longer than cotyledons.

Nom. Jap. *Hari-sembon* (nov.).

Hab. Prov. SHINANO: Kawakami-mura in Minamisaku-gōri (*K. Koyama!* 1904).

New to the Flora of Japan, very rare. In the specimens I examined, all the flowers bear no stamen, exhibiting a female habit.

Distrib. Siberia, Mandshuria, Mongolia, Northern and Central China, and Alaska.

Isoetes (Aquaticæ) **echinospora** Durieu in Bull. Soc. Bot. France, VIII. p. 164; A. Braun in Verhandl. Bot. Ver. Brandenb. (1862) p. 24; Babington in Journ. Bot. (1863) tab. 1; Milde, Fil. Eur. et Atl. (1867) p. 279; Baker in Journ. Bot. (1880) p. 67; Id. Handb. Fern-Allies (1887) p. 125; Engelm. in Trans. S. Louis Acad. Sc. IV. (1882) p. . . ; A. Gray, Man. Bot. ed. 5, p. 676; Sadebeck in Engler et Prantl, Nat. Pflanzenfam. I. 4, p. 776.

Calamaria echinospora O. Kuntze, Rev. Gen. Pl. II. p. 828.

Isoetes lacustris subsp. *echinospora* Hook. fil. Stud. Fl. Brit. Isl. ed. 2, p. 505, et ed. 3, p. 526.

var. asiatica Makino var. nov.

Sporangia unspotted, $\frac{2}{3}$ - $\frac{3}{4}$ covered by a broad velum. Leaves without stoma. Spinules of the macrospore stouter. Microspore smooth.

Small, wholly submersed. Caudex 2-lobed, about 7-20mm. across,

blackish brown; lobes hemispherical or compresso-hemispherical, the inner side densely emitting pale brown (but darkish brown when dry) roots. Leaves tufted, erect or erect-patent, about 8-30 in number, $3\frac{1}{2}$ -14 cm. long, $1\frac{1}{2}$ - $2\frac{1}{2}$ mm. across in the middle, darkish green, pale and pellucid and sometimes rosy towards the base, stiffish, straight or sometimes somewhat recurved, subulate, gradually tapering to the point which is obtuse under lens, septate, subterete and slightly plane in front, but broadly concave in front and lunate in section below, the lower edges thin and decurrent from the dilated and concave phyllopode, which is deltoid or broadly deltoid in form (4-7 mm. long, 5-11 mm. broad) and membranaceous on the border and closely imbricated. Velum orbicular to elliptical, with a semiorbicular to elliptical opening below extending to the middle. Ligule cordato-semiorbicular or lato-cordate, membranaceous towards the margin, $1\frac{1}{4}$ - $1\frac{3}{8}$ mm. across. Sporangia orbicular to elliptical, truncate or retuse at the upper end, compressed, thinly membranaceous, pale, $2\frac{1}{2}$ -4 mm. long. Macrospores white, globose, but very slightly depressed, marked on one hemisphere with a tricrural elevated line, densely spinulose all over; spinules erect, often broad and flattened, obtuse or truncate moreover often slightly curved at the apex. Microspores elliptical, slightly oblique in form.

Nom. Jap. *Hime-midzunira* (nov.).

Hab. Prov. SHINANO: Lake Nojiri (*Komesaburō Yazawa!* 1903; *T. Makino!* Aug. 30, 1904; *K. Shibata!* Sept. 26, 1904).

As diagnosed above, this differs from the typical one of Europe, which has the sporangia with a narrow velum, macrospores with narrower spinules, and slightly papillose microspores; and from *var. Braunii* Engelm. (= *I. Braunii* Durieu) of North America, which has the leaves with few stomata towards the tip, and spotted sporangia, more approaching the latter than the former. In Japan it is very rare, and the plant in question was found growing in the sandy bottom of shallow water near the margin of Lake Nojiri in the northern part of the province of Shinano, where Mr. Komesaburō Yazawa collected it first.

Isoetes (Amphibiæ) **japonica** A. Braun in Verhandl. Bot. Ver. Brandenb. (1862) p. 33; Baker in Journ. Bot. (1880) p. 109; Id. Handb. Fern-Allies, p. 132; Miq. Prol. Fl. Jap. p. 390; Franch. et Sav. Enum. Pl. Jap. II. p. 201; K. Ito, Nippon-Shokubutsu-Dzusetsu I. tab. 45; Sadebeck in Engler et Prantl, Nat. Pflanzenfam. I. 4, p. 778; Matsum. Ind. Pl. Jap. I. p. 363; ...

Calamaria japonica O. Kuntze, Rev. Gen. Pl. II. p. 828.

Isoetes edulis Sieb. ex Miq. Prol. Fl. Jap. p. 390.

Perennial, sometimes wholly submersed. Caudex 3-lobed, $\frac{1}{2}$ - $2\frac{1}{2}$ cm. across, blackish, densely emitting umber-coloured roots. Leaves tufted, erect or erect-patent, about 6-100 or more in number, 8-90 cm. long, 1- $3\frac{1}{2}$ mm. across below the middle, bright green, white and pellucid towards the base, subflaccid, slender, tapering towards the point which is obtuse under lens, subangulato-semiterete, plane in front, septate, usually stomatiferous, the lower edges thin and decurrent from the dilated and concave or subconcave phyllo-pode, which is subsquare or subdeltoid-subsquare or oval-subsquare (4-14 mm. long, 5-12 mm. broad) in form and thinly membranaceous (translucent towards the margin) in the border and thickly close-imbricated. Velum none; fovea elliptical to narrowly oblong. Ligule thinly membranaceous, cordato-deltoid, long-attenuated above and acuminate, 3-8 mm. long. Sporangia elliptical to narrowly oblong, compressed, thinly and delicately membranaceous, pale, unspotted, 4-9 mm. long. Macrospores white, globose, marked on one hemisphere with a tricurral elevated line, deeply and subregularly alveolate. Microspores oval-elliptical, slightly oblique in form, smooth, often crested with an entire margin.

Nom. Jap. *Midzu-nira*, *ike-nira*, *kawa-nira*.

Hab. Prov. MUSASHI: Ōmiya-hachiman in Wada-mura (*R. Yatabe* and *J. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, Nov. 23, 1879; Herb.! *ibid.* Nov. 9, 1890; *T. Makino*! June 3, 1888, Oct. 3, 1897, May 15, 1901), Ogikubo (*T. Makino*! Nov. 5, 1898), Himon-ya (*T. Makino*! July 1901), Tokyo, Bot. Gard., Koishikawa (*T. Makino*! Aug. 1895, July 1901, Sept. 23, 1904); Prov. SHIMOOSA: Junsai-numa in Kōnodai (*T. Makino*! May and Oct. 1896); Prov. SHIMOTSUKE: Udzumagawa in Tochigi-machi (*K. Kawaguchi*! herb. *ibid.* Jan. 1903); Prov. YAMASHIRO: Odani-no-ike in Nishi-kamomura (*Y. Tanaka*! Sept. 8, 1895); Prov. BITCHŪ: Itakura in Makanemura (*D. Nikai*! herb. *ibid.* Sept. 21, 1902); Prov. TOSA: Sakawa (*T. Makino*! 1884), Hirooka (*T. Makino*! Oct. 15, 1892).

Common and widely distributed in Japan. Caudex is in mud, and leaves, except the lower portion, are usually aerial, but sometimes wholly submersed when found in rapid rivulets.

***Epipogum japonicum* Makino sp. nov.**

An aphyllous orchid, 7-21 cm. high. Tuber obovoid or ellipsoid, with

annular nodular lines, 10-18 mm. long. Stem simple, erect, terete, fleshy, pale flavescent, minutely purple-striato-spotted, with 2-5 adpressed thin remote sheaths. Raceme erect, shorter than the stem, laxly 1-7-flowered; bracts ovate, very thin, longer than pedicels. Flowers rather large, with a short curved twisted pedicel, patent-nutant, 2 cm. Sepals and petals erect-patent, subequal, narrow-ovate, acute, pale flavescent, with purple-striato-spots, thin, margin not involute. Labellum inferior, large, sub-horizontal, deltoid, entire, thickish and fleshy, deeply concave, with a few inconspicuous rows of minute papillæ internally, pale, purple-maculate. Spur descending, stout, inflated, oblong, somewhat compressed, obtuse, slightly 2-4-lobed, about as long as the labellum, pale flavescent, streaked and speckled with purple towards the base. Anther carnose, 2-celled, sessile; pollinia 2, filiform-pedicellate, obovate, compressed, yellow. Column rather short, erect, enlarged above, compressed; clinandrium deeply concave; rostellum short and broad; gland conspicuous, semiorbicular, snowy white, creamy. Stigma broad, slightly prominent, distant from the rostellum, placed to the base of column. Ovary ovoid, not twisted, yellow, streaked with purple, subpapillose.

Nom. Jap. *Aoki-ran* (nov.).

Hab. Prov. SHIMOTSUKE: Nikkō, in shady forest at the eastern foot of Mt. Nychō (*N. Aoki*, and *M. Kurushima*! Sept. 28, 1904; *M. Kurushima* and *B. Ioki*! Sept. 29, 1904; *T. Makino* and *B. Ioki*! Oct. 16, 1904).

Very rare. As described above, this differs from *Epipogon aphyllum* Sw., which is also found in Japan. It was discovered on the 23rd of September of this year (1904), by Viscount Nobumitsu Aoki.

Woodsia (*Euwoodsia*) **Yazawai** Makino sp. nov.

A little fern, attaining about 7 cm. high. Caudex short, with delicate black roots, forming a thick mass with many bases of the old stipes, clothed with fulvous scales; scales thinly membranaceous, lato-ovate to lanceolate, irregularly subdenticulate, attaining about 4 mm. long. Stipes tufted, erect, much shorter than the frond, gracile, stramineous but rufous below, scaly towards the base, articulated above the middle, $\frac{1}{2}$ -2 cm. long. Frond angustato-lanceolate, acuminate, slightly narrowed below, bipinnatifid, 3-5 $\frac{1}{2}$ cm. long, $\frac{2}{3}$ -1 $\frac{1}{4}$ cm. wide, quite glabrous, green, thickish; pinnae 9-12 on each side, alternate but opposite or subopposite in the lower ones, erect-patent or nearly patent, remote, sessile or very shortly petioled, ovato-deltoid and cuneate at the base and attenuated towards the apex and with an acutish-

obtuse point, but deltoid and cuneato-truncate at the base in the lower ones, pinnatifid into 4-7-lobes, but deeply pinnati-parted into 5-7-lobes in the lower ones, the largest one 7 mm. long, 5 mm. broad; lobes erect-patent, cuneato-elliptical or cuneato-ovate, shortly attenuated above and with an acutish-obtuse tip, 2-4-crenato-lobulate; veins impressed above; rachis capillary, quite glabrous, green, but slightly stramineous below. Sori 1-3 to a lobe, intramarginal, rounded, when fully mature occupying the whole under surface of the pinnæ and rufo-ferruginous; indusium pateriform, irregularly deep-parted into a few (about 4-5) subovate thin-membranaceous lobes which are concealed under the sori, with long cilia projecting beyond the sorus. Sporangia subnumerous, the case rounded, the pedicel shorter than the case. Spore ovoid, umber, rugulose all over.

Nom. Jap. *Togakushi-denda* (nov.).

Hab. Prov. SHINANO: Summit of Mt. Togakushi (*K. Yazawa!* Aug. 29, 1904).

An alpine fern, growing in rocky place. It resembles *Woodsia glabella* R. Br., but the latter differs by having the thin, membranaceous and very obtuse pinnæ and the short, nearly entire lobes.

Woodsia (*Euwoodsia*) **ilvensis** (Linn.) R. Br. in Trans. Linn. Soc. XI. (1815) p. 173; Spreng. Syst. Veg. IV. (1827) p. 125; Ledeb. Fl. Alt. IV. p. 330; Id. Fl. Ross. IV. p. 510; Kaulf. Enum. Fil. p. 251; Kunze in Linnæa XXIII. p. 297; Hook. Fl. Bor.-Am. II. p. 259; Id. Sp. Fil. I. p. 63; Id. Brit. Ferns, tab. 8; Benth. Handb. Brit. Fl. ed. 5, p. 567; A. Gray, Man. Bot. ed. 5, p. 669; Eaton in Chapm. Fl. S. Un. St. p. 596; Metten. Fil. Hort. Bot. Lips. p. 98; Eaton, Ferns N. Amer. II. p. 111, tab. 60, fig. 5-8; Wood, Cl.-Book Bot. p. 822; Id. Amer. Bot. et Flor. p. 425; Maxim. Prim. Fl. Amur. p. 337; Reg. et Til. Fl. Ajan. p. 128; Reg. Tent. Fl. Ussur. n. 605; Hook. et Baker, Syn. Fil. ed. 2, p. 46; Lowe, Ferns Brit. et Exot. VII. p. 67, tab. 28; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 74; Miq. Prol. Fl. Jap. pp. 343, 390; Franch. et Sav. Enum. Pl. Jap. II. p. 204; Franch. Pl. David. I. p. 346; Kawakami, in Bot. Mag., Tokyo, XIV. p. 106; Diels in Engler et Prantl, Nat. Pfl.-Fam. I. 4, p. 161, fig. 88, D, E; Matsum. Ind. Pl. Jap. I. p. 351.

Acrostichum ilvense Linn. Sp. Pl. p. 1071, et ed. 2, p. 1528; Richt. Cod. n. 7787; Houtt. Nat. Hist. XXXII. (1783) p. 83, et Linn. Pfl.-Syst. XIII. (1786) p. 93.

Polypodium ilvense Sw. Syn. Fil. (1806) p. 39; Willd. Sp. Pl. V. p. 198; Schkuhr, Crypt. Gew. p. 16, tab. 19; Ait. Hort. Kew. ed. 2, p. 505; Presl, Tent. Pterid. p. 180.

Woodsia hyperborea var. *ilvensis* Luers.

Woodsia hyperborea subsp. *ilvensis* Hook. fil. Stud. Fl. Brit. Isl. ed. 3, p. 515.

Polypodium Marantæ Hoffm. Deutschl. Fl. II. p. 5.

Polystichum Marantæ Roth, 'Fl. Germ. III. p. 92.'

Acrostichum Marantæ Pall. 'It. III. p. 293.'

Nephrodium rufidulum Michx. Fl. Bor. Amer. II. p. 269.

Aspidium rufidulum Sw. Syn. Fil. p. 58; Willd. Sp. Pl. V. p. 282.

Lastrea rufidula Presl, Tent. Pterid. p. 76.

Woodsia rufidula Beck.

Woodsia hyperborea β. *rufidula* Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 731; Milde, Fil. Eur. et Atl. p. 164.

Woodsia hyperborea subsp. *rufidula* Korshinsky in Act. Hort. Petrop. XII. (1893) p. 430.

Woodsia Rajana Newm. 'Brit. Ferns, p. 140.'

Polypodium Arvonicum With. 'Brit. Pl. II. p. 774,' non Sw.

Woodsia (Preslia) paleacea Opiz.

Woodsia intermedia Rupr.

Aspidium distans Viv.

Cincinnatiæ setigera Desv.

Woodsia vestita Spreng. 'Nov. Proven. p. 44, excl. syn. Sw. et Michx.'

About 9-13 cm. high. Caudex short, ascending, thick with the many bases of the old stipes; roots black. Stipes tufted, erect, articulated below the middle, rufous but castaneous-rufous below, glossy, scaly, about 3-5 cm. long; scales isabel-coloured, thinly membranaceous, sharply acuminate, the lower ones lanceolate ovato-lanceolate or subulato-lanceolate, the superior ones linear-hirsute. Frond broadly lanceolate, longer than the stipe, bipinnati-parted, paleaceo-hirsute beneath, 5-8 cm. long, 1½-2 cm. broad; pinnæ subcoriaceous, spreading, alternate or subopposite, oblong-ovate, obtuse, cuneato-truncate and sessile at the base, pinnati-parted, the middle ones larger; pinnules nearly patent, 4-5 on each side, ovate or elliptical-ovate, obtuse, more or less reflexed and obscurely crenate on margin; veinlets free, usually forked; rachis clothed with paleaceo-hirsute scales. Sori intramarginal, numerous, closely placed, at length confluent; indusium deeply creft into long incurved hairs. Sporangia: the case globose; the pedicel very short.

Nom. Jap. *Miyama-iwadenda* (T. Kawakami).

Hab. Prov. KITAMI in Hokkaidō: Summit of Mt. Rishiri in Isl. Rishiri (*T. Kawakami!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1901; *T. Makino!* Aug. 1903).

Woodsia (*Euwoodsia*) **japonica** Makino nom. nov.

Woodsia sinuata Makino in Bot. Mag., Tokyo, XI. (1897) p. 64, non Christ, nec *W. polystichoides* γ. *sinuata* Hook.

Nom. Jap. *Kogane-shida*.

Add. Hab. Prov. SHIMOTSUKE: Mt. Kōshin (*T. Makino!*), Nikkō (*T. Makino!*).

This differs from *W. sinuata* (Hook.) Christ, by the decurrence of the base of pinnæ against rachis, the density and form of hairs on frond, the form of scales of the base of stipe, the size of indusium, the state of articulation of the stipe, etc.

Woodsia (*Euwoodsia*) **sinuata** (Hook.) Christ Fil. Faurieanæ IV. in Bull. Herb. Boiss. 2^{me} Sér. II. p. 830 (1902), non Makino.

Woodsia polystichoïdes γ. *sinuata* Hook. Gard. Ferns (1862), tab. 32, fig. 3; Hook. et Baker, Syn. Fil. ed. 2, p. 48; Yabe in Bot. Mag., Tokyo, XVII. p. 63, excl. syn. *W. sinuata* Makino.

About 6-16 cm. in height. Caudex short, ascending, thick; roots brownish-black, with root-hairs. Stipes tufted, erect, or erect-patent, stramineous to deep-rufous, clothed with scales at the base, but hairy with fibrillose scales throughout and loosely mixed with ovato-lanceolate or subulato-lanceolate very sharply acuminate scales as is the rachis, furnished with a very oblique incomplete joint at the top, about 2-5 cm. long; basal scales rufo-isabel-coloured, ovate to ovato-lanceolate, very attenuatedly acuminate, very laxly lacerate, concave, membranaceous. Frond lanceolate, longer than the stipe, about attaining 13 cm. long, 2½ cm. broad, bipinnatifid, membranaceous, thinly covered with very sharply acuminate linear-lanceolate to fibrillose scales on veins and veinlets beneath, subglabrous or very sparingly pilose above; pinnæ about 8-16 on each side, usually subopposite but often alternate above, spreading, more or less remote, but much remote below, deltoid or deltoid-ovate, the upper ones passing into ovato-oblong to ovato-lanceolate and often subfalcate in form, obtuse at the apex, subtruncate or cuneato-truncate and very shortly petiolate at the base, but sessile in superior ones, subauricu-

late in the upper lowest side, pinnatifid, but entire or crenato-lobed in the superior ones, lobes about 3-5 on each side below, spreading, oval-ovate or elliptical-ovate, rounded at the apex, entire and often somewhat reflexed on margin; veinlets free, loose, pauci-pinnate or forked; rachis straight, slender, rufous or stramineous. Sori intramarginal, about 3 to 8 to a lobe, small, rather closely placed, dorsal near the end of the veinlets; indusium pateriform, fragile, irregularly parted or lobed into a few suboval or suboval-ovate thin lobes not exceeding the sori, with long incurved cilia on margin. Sporangia: the case rounded; pedicel very short.

Hab. COREA (CHŌSEN): Seoul in Mt. Namsan, Kyōng-gui (*U. Faurie!* no. 718, May 1901; *T. Uchiyama!* herb. Sc. Coll. Imp. Univ. Tokyo, July 30, 1902).

I have not yet seen in Japan. My specimens are due to the kindness of Rev. Urbain Faurie.

As regards to the indusium, *W. sinuata* (Hooker) apparently belongs to the sect. *Euwoodsia*, but as to the articulation of the stipe, it is similar to that of *W. polystichoides* Eat., which is placed within the sect. *Physematium* by many authors.

There is a plant from the Namsan of Corea in the herbarium of the Sc. Coll. Imp. Univ. Tokyo, collected by T. Uchiyama. It approaches very much to *W. sinuata* (Hooker), having the indusium of *W. polystichoides* Eaton.

Woodsia (*Physematium*) **obtusa** (Sw.) Torrey 'Catal. Pl. in Geol. Rep. New York (1840)'; Id. 'Fl. New York II. p. 500'; Hook. Sp. Fil. I. (1846) p. 62; Id. Gard. Ferns (1862) tab. 43; A. Gray, Man. Bot. ed. 5, p. 668, tab. 18, fig. 4-5 (quoad *Woodsia*); Eaton in Chapm. Fl. S. Un. St. p. 596; Hook. et Baker, Syn. Fil. ed. 2, p. 48; Metten. Fil. Hort. Bot. Lips. (1856) p. 98; Milde, Fil. Eur. et Atl. (1867) p. 166; Lowe, Ferns Brit. et Exot. VII. (1872) p. 69, tab. 29; Eaton, Ferns N. Am. II. (1880) p. 189, tab. 71, fig. 5-8; Wood, Class-Book Bot. p. 822, et Am. Bot. et Fl. p. 425; Christ, Farnk. Erde, p. 282, fig. 893; Diels in Engler et Prantl, Nat. Pfl.-Fam. I. 4, p. 161, fig. 88, C.

Polypodium obtusum Swartz, Syn. Fil. (1806) pp. 39, 420; Schkuhr, Crypt. Gew. p. 18, tab. 21.

Aspidium obtusum Willd. Sp. Pl. V. (1810) p. 254; Schkuhr, Crypt. Gew. p. 197. tab. 43^b.

Cystopteris obtusa Presl, Tent. Pterid. (1836) p. 93.

Physematium obtusum Hook. Fl. Bor.-Am. II. (1840) p. 259.

Hypopeltis obtusa Torrey 'Compend. p. 380.'

Alsophila Perriniana Spreng. Syst. Veg. IV. (1827) p. 125.

Physematium Perrinianum Presl, Tent. Pterid. (1836) p. 66 ; Kunze, Anal. Pterid. (1837) p. 43.

Cystopteris Perriniana Link 'Hort. Berol. II. p. 131.'

Woodsia Perriniana Hook. et Grev. Ic. Fil. I. tab. 68 ; Fée, Gen. Fil. (1850-52) p. 338.

Cystopteris albescens Link (1841).

Caudex short ; roots delicate, black, with short rootlets. Stipes erect, stramineous but fulvous at the base, dispersed with lanceolate thinly membranaceous isabel-coloured scales, 6-10 cm. long. Frond broadly lanceolate, membranaceo-herbaceous, minutely glandular, nearly bipinnate, about 9-15 cm. long, 3-5 cm. broad ; pinnae remote, spreading, subopposite, subsessile, deltoid-ovate, but narrower in the superior ones, obtuse, nearly truncate at the base, deeply pinnati-parted, the middle ones larger ; pinnules a little remote, nearly patent, oblong or oblong-ovate, obtuse, sessile, crenato-lobate, but the lower ones deeply lobate and extremely shortly petiolate ; lobes oval, crenulate ; veins free, pinnate ; veinlets free, loosely pinnate or forked ; rachis slender, minutely glandular. Sori small, intramarginal, dorsal and subterminal on the veinlets ; indusium of a few unequal-sized concave and toothed lobes, thinly membranaceous, fragile, pale rufous, at first subglobose and protecting the sporangia, afterwards spreading. Sporangia : the case globose, the pedicel very short.

Nom. Jap. *Ise-denda* (nov.)

Hab. Prov. ISE : Hawaka-mura in Suzuka-gōri (*M. Kawasaki!* June 1903).

New to the Flora of Japan, rare.

Distrib. North America and Iceland.

Hutchinsia (*Noccaea*) **alpina** (Linn.) R. Br. in Ait. Hort. Kew. ed. 2, IV. p. 82 ; DC. Syst. II. p. 389, et Prodr. I. p. 178 ; Spreng. Syst. Veg. II. p. 863 ; Koch, Syn. Fl. Germ. et Helv. ed. 3. p. 63 ; Prantl in Engler et Prantl, Nat. Pfl.-Fam. III. 2, p. 188.

Lepidium alpinum Linn. 'Cent. Pl. II. p. 23' ; Id. 'Amœn. Acad. IV. p. 321' ; Id. Sp. Pl. ed. 2, p. 898 ; Richt. Cod. n. 4681 ; Houtt. Nat. Hist.

XXVI. (1778) p. 614, et Linn. Pf.-Syst. VIII. p. 212; Willd. Sp. Pl. III. p. 433, et Enum. Pl. Hort. Bot. Berol. p. 665; Lam. Ill. tab. 556, fig. 2; Pers. Syn. Pl. II. p. 187.

Draba alpina Baumg. 'Enum. Stirp. Transs. II. p. 232,' non. Linn.

Smelowskia alpina C. A. May. in Ledeb. Fl. Alt. III. p. 170, in obs.

Nocca alpina Reichb. Fl. Germ. Excurs. p. 663.

Pritzelago alpina O. Kuntze, Rev. Gen. Pl. I. p. 35.

Draba Nasturtium Scop. 'Fl. Carn. ed. 2, II. p. 8.'

Lepidium Halleri Crantz, 'Stirp. Austr. ed. 1, fasc. 1, p. 5.'

Lepidium brevicaulis Hoppe, 'ex Mert. et Koch, Deutschl. Fl. IV. p. 519.'

Hutchinsia brevicaulis Hoppe, 'ex Sturm, Deutschl. Fl. Heft. 65'; Spreng. Syst. Veg. II. p. 863; Koch, Syn. Fl. Germ. et Helv. ed. 3. p. 63.

Nocca brevicaulis Reichb. Fl. Germ. Excurs. p. 663.

Pritzelago? brevicaulis O. Kuntze, Rev. Gen. Pl. I. p. 35.

Hutchinsia affinis Gren 'ex Schultz, Arch. Fl. Fr. Allem. p. 274.'

Hutchinsia Auerswaldii Willk. 'Sert. Fl. Hisp. p. 14.'

Hutchinsia caulifera Schur, 'Enum. Pl. Transs. p. 71.'

Biennial? attaining about 22 cm. long, divided at the base; tap-root slender, perpendicular, branched. Stem simple, slender, puberulent, the lower decumbent and destitute of leaves but with old petioles. Leaves sparse, approximate, but much loosely dispersed above, petiolate, pinnati-parted, attaining about 2 cm. long including the petiole; leaflets usually 5, elliptical or elliptical-oblong, acute on both ends, entire, glabrous, subcarnose, the lateral leaflets patent, a little remote, subfalcate, about equal to the odd one in size; petiole longer than the blade, somewhat dilated towards the base. Raceme many-flowered, erect; rachis puberulent as is the pedicel. Flower white, about 8 mm. across; pedicels erect-patent, 3-5 cm. long in flower. Sepals oval or oval-elliptical, rounded-obtuse at apex, concave, herbaceous, glabrous, viridescens, but scarious on margin, 3-nerved, with a few and loosely subreticulated veinlets, 2-3 mm. long, deciduous. Petals nearly twice as long as sepals, orbicular or oval, rounded or truncato-rounded at apex, shortly unguiculate, loosely nervate, $3\frac{1}{2}$ - $4\frac{1}{2}$ mm. long. Stamens often slightly shorter than sepals; filament subulato-filiform; anther elliptical, with yellow pollen. Ovary fusiform, viridescens, very minutely and loosely puberulent on both margins; valve 1-nerved and with loosely reticulated veinlets; stigma sessile (style none), thickish, concave, sub-4-lobed, minutely pubescent. Ovules 2 in each loculament, pendulous from the upper

portion of the placentas, with a distinct and curved funicule. Silicle (immature) fusiform, acute at both ends, 3 mm. long.

Nom. Jap. *Karakusa-nadzuna* (nov.).

Hab. Prov. ISE: Summit of Mt. Oike in Inabe-gōri (*M. Kawasaki*! Aug. 9, 1904).

New to the Flora of Japan, very rare. In my specimens, hairs on the stem, on the rachis of raceme, and on the pedicels are simple, not forked; the stigma is sessile having no style. In Japan, the occurrence of this plant, which was hitherto confined to Europe, is highly interesting.

Gleichenia (*Mertensia*) **kiusiana** Makino sp. nov.

Rhizome widely repent, strong, terete, hard, clothed with scales (scales often deciduous, therefore the rhizome naked and dispersedly submuricated with short hard processes which are the bases of scales), very laxly branched, loosely rooting, brownish-fulvous, about 5 mm. across; roots rather short, black, with short rootlets. Stipe distantly placed on the rhizome, erect, slender, long, hard, subterete, shallowly and broadly furrowed with an obtuse or subacute slender margins throughout in front, rounded in the back, glabrous and viridescent, but brownish fulvous and clothed with scales at the base (which is, when scales fallen off, submuricate as is the rhizome), attaining about 7decim. in length, 4-6½ mm. across below, with a fibrovascular bundle in centre. Scales rufo-ferruginous, lanceolate to ovate, long-acuminate, auriculate or nearly so at the base, entire, firm-membranaceous, with close very numerous and minute longitudinal areolæ, often deciduous. Frond unijugate in first year, but bijugate in the next year (the second stipe developed from the axillary bud which is situated between the first pair of frond, 9-20 cm. in length, erect, furnished with a minute rudimentary bud at the top); pinnæ furcately opposite, very shortly petioled, ovate to angustate-ovate, attenuatedly acuminate at the apex, obtuse at the base, rigid, yellowish green, concolorous, glabrous above, but beneath densely covered with very minute translucent granules under microscope and thinly dispersed with adpresso-declinate short subclavate minute glandular hairs which are black in the apical portion, attaining 50 cm. long, 27 cm. broad, those of the superior pair smaller; rachis slender, obscurely flexuous, narrowly canaliculate in front, pale stramineous, glabrous. Pinnules numerous, about 18-28 on each side, closely placed, erect-patent, alternate, very shortly stipitate, but sessile in the superior ones, narrowly lanceolate, acuminate, subobliquely acute at the base, attaining about 20 cm. long, 4 cm. wide,

the lower ones largest excepting the lowest one smaller; second rachis slender, very shallowly canaliculate in front, prominent dorsally, glabrous, pale stramineous. Segments cut down to the rachis, numerous, alternate, regularly and pectinately arranged, a little remote, erect-patent, adnate and decurrent at the interior base to the rachis, linear-lanceolate; gradually attenuated above, acute-acuminate, recurved but revolute when dried on the margin, entire but often obscurely crenulate, attaining 23 mm. long, 3 mm. broad; midrib slender, prominent beneath; veins erect-patent, rather loose, usually bifurcate near the base but some of them again bifurcate, the superior ones simple. Sori of 3-4 sessile and globose sporangia, dorsal at the lower part of the exterior branch of veins, rather loosely arranged on about lower half of segments, one-serial on each side. Bud axillary, globose or subovoid, densely clothed with scales which are similar to those of the base of stipes.

Nom. Jap. *Kaneko-shida* (nov.).

Hab. Prov. HIZEN in Kiusiu: Mt. Kurokami in Arita (*Y. Kaneko!* Aug. 26, and Oct. 1904).

A rare and well-marked fern. It differs from *Gleichenia glauca* (Thunb.) Hook., which has the very long and not canaliculate stipe, the fimbriato-margined scales, the multijugate frond, the glaucous and not glandular-hairy pinnæ, and the close and obtuse segments.

***Parnassia alpicola* Makino sp. nov.**

A little perennial, about 14 cm. high, quite glabrous. Rhizome short or somewhat elongate, ascending, emitting delicate roots. Stem solitary (constantly?), simple, erect, slender, gracile, angulate, uniflorous, green. Radical leaves tufted, long-petiolate, reniform with rounded lobes, decurrent to the petiole at the base, rounded or obscurely emarginate with a subcallose minute point in centre at the apex, entire, membranaceous, 7-13 mm. across, usually 9-nerved; petiole gracile, very narrowly winged, 10-27 mm. long, the basal vagina thinly membranaceous, ovato-lanceolate, with a minute linear erect free lobe on each side at the top; cauline one solitary, situated below the middle of the stem, sessile, amplexicaul, reniform-orbiculate, cordate with rounded lobes at the base, rounded with a subcallose minute point at the apex, 8-10 mm. across, 9-nerved. Flower terminal, about 11 mm. across, white. Calyx-tube short and depressed-obconical, adnate to the base of the ovary; lobes 5, erect-patent, lanceolato-ovate, obtuse, entire, thickish, trinerved, green, $2\frac{1}{2}$ mm. long, persistent. Petals 5,

spreading, distinctly unguiculate, twice the length of the calyx-lobes, 5 mm. long; lamina broadly ovate, obtuse at the apex, subtruncato-obtuse and decurrent to the unguis at the base, obscurely and minutely serrulate on margin, sub-5-nerved, deciduous; unguis $\frac{1}{3}$ as long as the the lamina, narrower below. Stamens 5, slightly exceeding the calyx-lobes; filament subulate, white; anther broadly rounded, emarginate at the apex, bilobed at the base, the cell semiorbicular. Staminodes 5, slightly shorter than the calyx-lobes, spatulate; the lamina broadly deltoid-flabellate, truncate and with a comb of 5-6 finger-like short branches, which are unequal in length and merely obtuse (no globule) at the end, 1 mm. or a little more across; the stipitate portion rectangular. Pistil equal to the calyx-lobes in height; ovary ovoid, sessile, smooth, green, with 3 parietal placentas, many-ovuled; style very short; stigmas 3, conspicuous, erect-patent and slightly recurved, elliptical-oblong, obtuse. Capsule (immature) globose, green, crowned with a short style and stigmas, about $4\frac{1}{2}$ mm. across. Seeds (immature) numerous, oblong, often narrowed below, 1 mm. long.

Nom. Jap. *Hime-umebachisō* (nov.).

Hab. Prov. SHINANO: Alpine summit of Mt. Shirouma (*Kwan Shimura*! August 20, 1904).

Rare. By the much smaller and more delicate habit, the reniform leaves, the long-unguiculate petals, the staminodes with shorter fewer and not capitellate branches, and 3-carpellary ovary, etc., present one should be specifically separated from *Parnassia palustris* Linn.

Salix Thunbergiana Blume **subsp. melanostachys** Makino.

Salix melanostachys Makino in herb. Sc. Coll. Imp. Univ. Tokyo.

Salix nigrolepis Shirai MS.

Shrub, attaining about 2 m. or more in height, many-branched. Branchlets terete, glabrous, purplish brown; bud-scale coriaceous, glabrous but sometimes slightly puberulent. Leaves petiolate; young ones glabrous, but sometimes ciliated and puberulent on veins beneath; adult ones lanceolate, oblanceolate, or obovato-lanceolate, acute or acuminate-acute with a mucronate tip, acute at the base, serrulate with mucronate small teeth, very narrowly reflexed on margins, chartaceo-coriaceous, glabrous on both sides, green above, glaucous beneath, attaining 9 cm. long, $2\frac{4}{5}$ mm. wide; midrib prominent beneath; veins numerous, about 6-15 on each side, rather loose, slender, erect-patent, arcuate upwards and reaching the margin, prominent beneath; veinlets very numerous, rather close, transverse

between the veins, delicate, prominent beneath, forming small areolae between veinlets; petiole 2–12 mm. long, semiterete, dilated towards the base, glabrous; stipules sessile or subsessile, oblique in form, falcato-lunate, acute, serrulate, shorter or somewhat longer than the petiole, chartaceo-coriaceous, subglaucous and veiny beneath, glabrous. Catkins (male) appearing before the leaves, laxly placed, lateral, sessile or very shortly stipitate, sometimes few-bracteate, cylindrico-oblong, obtuse, very densely scaly, 2–4 cm. long; bracts small, squamiform, oblong, entire or minutely serrulate. Scales subulate to subulato-lanceolate, or ovato-subulate, attenuately acuminate, black excepting the base, loosely ciliated with villose white hairs (hairs not exceeding the scale) on the margin, glabrous on both surfaces, about $2\frac{1}{2}$ –4 mm. long. Stamens 2 but united to 1, longer than scales, 6 mm. long, glabrous; filaments filiform, white; anthers 2, close one another, connected at the base dorsally, lato-oval. Rudimentary pistil 1, linear, subbifid-truncate at the top, 1 mm. long. Female plant unknown.

Nom. Jap. *Kuro-yanagi*.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*S. Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo; *J. Matsumura!* herb. ibid. April and May 1881; *K. Sawada!* herb. ibid. July 23, 1879, *T. Makino!* herb. ibid. March 1896; *S. Matsuda!* herb. ibid. March 18, 1890, April 14, 1903, June 6, 1903; *T. Makino!* June 2, 1890, Sept. 27, 1895, Oct. 1898, March 28, 1899, Aug. and Nov. 9, 1900); Prov. MINO: Kusafuka, cult. (*T. Makino!* Aug. 1899).

This is cultivated, and the female plant yet unknown to us. It differs from the type of *Salix Thunbergiana* Bl., which bears following characters, namely: Branchlets tomentoso-pubescent; leaves adpressed-tomentoso-pubescent beneath, tomentoso-pubescent on midrib and when young thinly tomentose above, petiole tomentoso-pubescent; stipule tomentoso-pubescent beneath; catkin (male) cylindrical, or oblong-cylindrical, 3–8 cm. long; scales triangular-subulate to linear-subulate, acuminate, long-villose on the margin and both surfaces (hairs much exceeding the scales); stamen much longer than scales and exceeding its hairs. The form and venation of leaves similar in both ones.

Swertia (*Ophelia*) **Tashiroi** (Maxim.) Makino in Bot. Mag., Tokyo, XVII. (1903) p. 53, in nota.

Ophelia Tashiroi Maxim. in Mém. Biol. XII. p. 495 (1886).

Biennial, 13–37 cm. in height, glabrous. Roots often spreading. Stem robust, erect, terete, attaining about 7 mm. in diameter at the

base, passing into the rachis of the panicle above. Leaves opposite, spreading; the basal ones ample, decussate, approximate, elliptical to broad-oblong, attenuated into a stem-clasping short and subwinged petiole at the base, abruptly acuminate-cuspidate at the apex, entire, subtriplinerved, membranaceous when dried, attaining 22 cm. long, 6 cm. broad; veinlets inconspicuous; upper ones laxly placed, much smaller, sessile or nearly so, ovato-elliptical or elliptical, acuminate. Panicle large, pyramidal or elliptico-pyramidal, 8-21 cm. long, 7-14 cm. broad, laxly several-many-flowered; rachis straight, terete, erect; branches opposite, patent or erect-patent, with 1-5 cymose pedicellate flowers, $\frac{1}{2}$ -7 cm. long excepting the pedicel and shorter than bracts; bracts leafy, ovate to angustato-lanceolate, acuminate, sessile or nearly so, patent, 3-8 cm. long, $\frac{1}{3}$ -3mm. broad; bracteoles small, linear or linear-lanceolate, the uppermost ones minute and subulate, usually adpressed. Flowers large, 2-2 $\frac{2}{3}$ cm. long, nutant, campanulate, 5-merous; pedicel slightly enlarged above, shorter than the flower, $\frac{2}{3}$ -2 $\frac{1}{3}$ cm. long, curved downwards. Calyx deeply 5-parted, 6-10 mm. long, green; lobes erect-patent; deltoid to ovato-deltoid, acute, entire, thickish towards the centre, subcarinate, 1-nerved, with loose veinlets. Corolla much exceeding the calyx; the tube very short; lobes contorted, elliptical to elliptical-oblong, subacute and minutely bifid at the apex, entire, 19-24 mm. long, 9-13 mm. wide, with delicately anastomosing veinlets, numerous punctate internally, with a large subdeltoid-rounded or lato-orbicular subfoveolate gland above the base. Stamens 5, inserted at the top of the corolla-tube, included, slightly shorter than the corolla-lobe, 15-20 mm. long; filament linear-subulate, stout; anther oblong, shorter than the filament, 6 mm. long, obtuse at the apex, deeply bifid below. Pistil slightly lower than filaments; ovary lanceolate, gradually attenuated on both ends; style very short; stigma bifid, thickish, orbicular. Capsule subsessile, a little exceeding the persistent corolla, attenuated above, ovoid-lanceolate, with a short persistent style and stigmas; seeds numerous, small, nearly parallelopiped-form, subtruncated on both ends, rufous, muricate all over.

Nom. Jap. *Shima-akebonosō*, *hetsuka-rindō* (Y. Tashiro).

Hab. YAYEYAMA ARCHIP. (Y. Tashiro! herb. Sc. Coll. Imp. Univ. Tokyo, Oct. 1886).

Leaves similar to those of *Swertia Kuroiwai* Makino, so that we can not separate them with sterile specimen, but the flowers are apparently different.

Swertia (*Ophelia*) **Kuroiwai** Makino in Bot. Mag., Tokyo, XVII. (1903) p. 53.

Swertia Tashiroi Makino l. c. X. (1896) p. 57, excl. syn., non XVII. p. 53, in nota.

Attaining 7 decim. in height. Stem robust, terete, attaining $1\frac{1}{2}$ cm. across at the base. Leaves: basal ones approximate, subtriplinerved or very loosely penninerved, attaining 34 cm. long, including the petiole, 11 cm. broad. Panicles terminal and sometimes axillary; peduncles attaining 7 cm. long; pedicel bracteolate at the base. Flowers attaining 2 cm. across, sometimes subcernuous. Calyx attaining 7 mm. long, 1-nerved, with very loose vienlets. Corolla-lobes erect-patent, ovato-elliptical to spathulato-lanceolate, abruptly short-acuminate with a minute bifid tip, disparsed with small spots internally, with delicate anstomosing veinlets, attaining 13 mm. long, the gland lato-orbicular and situated above or in the middle. Filament 5-6 mm. long; anther narrowly ovato-oblong, obtuse at the apex, deeply bifid below, 4-5 mm. long. Stigma: lobes semiorbicular. Capsule 18 mm. long. Seeds rufous, subcompressed or subangulate, muricate all over.

Nom. Jap. *Ryūkyū-akebonosō* (T. Makino).

Hab. TOKARA ARCHIP.: Isl. Nakano-shima (*Y. Tashio!* 1890); LIUKIU: Mt. Onna in Isl. Okinawa (*K. Kuroiwa!* Aug. 1893); AMAMI ŌSHIMA (*T. Uchiyama!* herb. Sc. Coll. Imp. Univ. Tokyo, Dec. 3, 1900), Near Naze (*T. Uchiyama!* herb. ibid. Dec. 13, 1900), Mt. Takamine-tōge (*T. Uchiyama!* herb. ibid. Dec. 7, 1900).

Rubia cordifolia Linn. var. **hexaphylla** Makino var. nov.

Stem stouter, 6-angulate, the angles retrorsely aculeolato-muricate. Leaves 6-verticillate, patent or reflexed, long-petiolate, cordate, sharply long-acuminate, membranaceous, 7-9-nerved, scabrous above, loosely retrorsely aculeolato-muricate on nerves beneath, attaining 7 cm. long, $4\frac{1}{2}$ cm. wide; petiole attaining 10 cm. long, slender, loosely retrorsely aculeolato-muricate. Bracts opposite, smaller than leaves, patent, lato-ovate, acute or acuto-acuminate, rounded or subcordate at the base, petiolate; bracteoles opposite, patent, often small, ovato-oblong, acute at both ends, petioled. Flowers 4 mm. across; pedicel $1\frac{1}{2}$ -6 mm. long. Corolla 5-fid; lobes deltoid, acute. Stamens 5, included; anther oblong, slightly longer than the filament. Style short; stigmas 2, capitate. Ovary turbinato-ovoid, glabrous. Fruit larger, halved or twin, black, about 9 mm. long; seed about 6 mm. across.

Nom. Jap. *Ō-akane* (nov.).

Hab. Prov. SHINANO: Fudō-zawa in Mt. Togakushi (*H. Takeda*! July 18, 1904, flower; *T. Makino*! Aug. 29, 1904, fruit).

Rare; the fruit ripens in August, just when *var. β. Munjista* (Roxb.) Miq., which is very common in Japan, begins to blossom; it is larger in size than that of Miquel's variety.

Diplachne fascicularis (Lam.) Beauv. *Agrost.* p. 80, tab. 16, fig. 9; *Rœm. et Schult. Syst. Veg.* II. p. 614; *Spreng. Syst. Veg.* I. p. 351.

Festuca fascicularis Lam. *Tabl. Encyc.* I. p. 189; *Steud. Syn. Pl. Gram.* p. 313.

Leptochloa fascicularis A. Gray, *Man. Bot.* ed. 5, p. 623; *Wood, Cl.-Book Bot.* p. 803, et *Am. Bot. et Fl.* p. 406, non Griseb.

Festuca polystachya Michx. *Fl. Bor. Am.* I. p. 66; *Pers. Syn. Pl.* I. p. 94; *Willd. Enum. Hort. Bot. Berol.* p. 117.

Leptochloa polystachya Kunth 'Rev. *Gram.* I. p. 91'; *Id. Enum. Pl.* I. p. 271, et *Suppl. I.* p. 223, tab. 16, fig. 2; *Chapm. Fl. S. Un. St.* p. 559.

Festuca aquatica Bosc, ex *Rœm. et Schult. Syst. Veg.* II. p. 615.

Festuca multiflora Walt. 'Fl. Carol. p. 81.'

Festuca procumbens Muehl. 'Desc. *Gram.* p. 160.'

Bromus poaeformis Spreng. 'Nachr. I. Bot. Gard. Halle, p. 15; *Fl. Hal. Mant.* p. 34,' non *Forsk. nec Vahl.*

Nom. Jap. *Hama-gaya* (nov.).

Hab. Prov. ISE: Coast of Yokkaichi (*Y. Uyematsu*! Sept. 12, 1903, July 29, 1904).

Introduced. A North-American grass.

Rynchospora (Haplostylæ) **nipponica** Makino sp. nov.

About 5 decim. or more high. Culm erect, concealing with leaves, except the upper portion, triquetrous with smooth edges, green, the upper portion narrower and passing to the rachis at the top. Leaves: cauline ones close; the sheath long, triangular, truncate in the mouth; lamina exceeding the inflorescence, linear, gradually attenuatedly acuminate, smooth-margined but scabrous towards the apex, chartaceous, delicately carinate beneath, 3 decim. or more long, 5-6 mm. wide; main veins 3-5 on each side. Corymbs forming a terminal and few lateral sphaerical or hemisphaerical many-spiculose heads, which are interruptedly spicately disposed on the rachis

and about $1\frac{1}{2}$ cm. in diameter; rachis triquetrous with smooth edges, green, straight; bracts patent-reflexed, slenderly linear, gradually acuminate, triquetrous towards the apex, scabrous-margined, delicately carinate beneath, not vaginate, the lowest one largest and about 14 cm. long, the superior ones smaller; bracteoles setaceous, slightly longer or shorter than spiculae. Spiculae lato-lanceolate, attenuatedly acuminate, acute at the base, compressed, glabrous, pale fulvous, about 7 mm. long, with 1 perfect flower below and 1 very minute rudimentary flower above. Glumes deeply navicular, carinate with a smooth and viridescent edge, membranaceous, pale towards the base; empty ones 4-6, oval-ovate, the lower ones gradually smaller and shorter; flowering ones 2, much larger than empty ones, the inferior one lato-ovate with an acute or acutish tip, the superior one largest and ovate with an obtuse tip, $6-6\frac{1}{2}$ mm. long. Setae 6, delicate, filiform, smooth, irregularly flexuous, white, unequal in length, the longest one a little exceeding the rostrum of the achene and about $5-5\frac{1}{2}$ mm. long, the shortest one about equal to the middle of the rostrum. Stamens 3, slightly exerted; filament slender, filiform, glabrous, somewhat exceeding the rostrum of the matured achene, about $6\frac{1}{2}$ mm. long. Achene rounded, compressed, suddenly short-stipitate, very shortly produced at the apex, with an obtuse margin, transversely rugulose towards the centre of faces, yellowish umber, 2 mm. and a little more in length including the stipitate portion; rostrum slender, longer than the achene, but very much



narrower than it in width, gradually attenuated above, sessile and truncate with a free edge at the base, compressed, viridescent.

Nom. Jap. *Mikuri-gaya* (nov.).

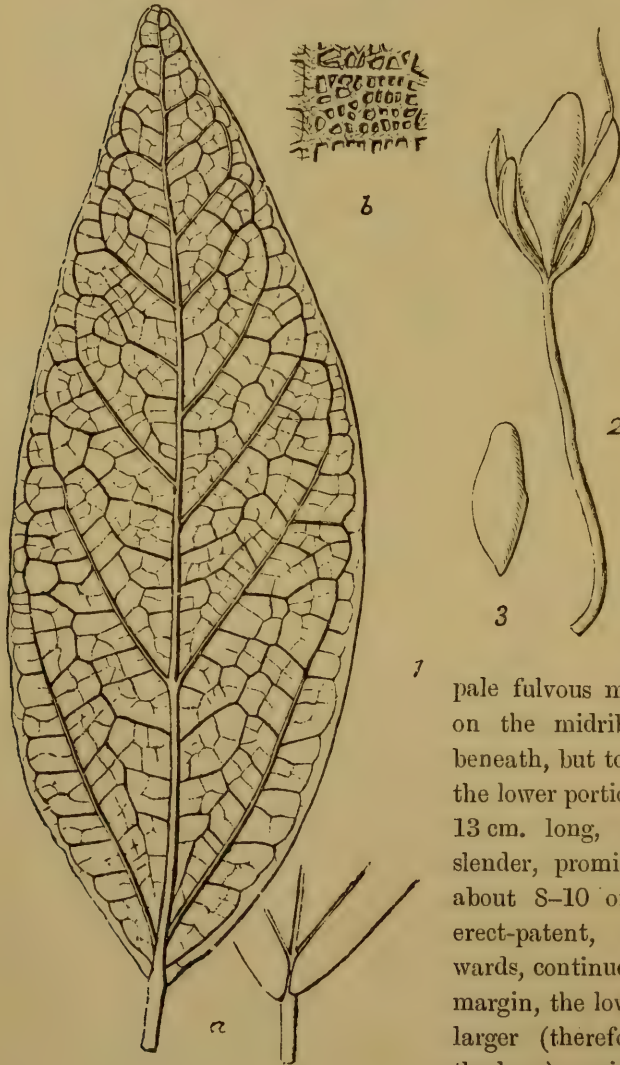
Hab. Prov. MIKAWA: Futakawa (*Z. Umemura!* no. 90, Sept. 7, 1904).

Isoetes japonica A. Br. Vide supra.

Stock attaining 8 cm. in diameter. Caudex-lobes thick, deltoid, obtuse,

perpendicular or divergent, nigrescent, densely emitting roots on the inner side. Leaves attaining 200 or more in number and 114 cm. in length (so in the submersed or nearly submersed one), 6 mm. across in the base above the phyllopode.

Ficus (Eusyce) **Awkeetsang** Makino sp. nov.



Leaves (*Fig. 1, a. nat. size*) petiolate, oblong - lanceolate, very hardly oblique in form, gradually more or less attenuated above and with an obtuse tip, broadly acute below and obliquely subcordate at the very base, entire, narrowly somewhat reflexed and crispulate on margin, chartaceo-coriaceous, green and glabrous but subpubescent on the midrib and veins above, covered with

pale fulvous minute pubescent hairs on the midrib veins and veinlets beneath, but tomentoso-pubescent in the lower portion of the midrib, about 13 cm. long, 5 cm. broad; midrib slender, prominent beneath; veins about 8-10 on each side, slender, erect-patent, hardly arcuate upwards, continued before reaching the margin, the lowest two opposite and larger (therefore subtriplinerved at the base); veinlets (*Fig. 1, b. mag.*)

very densely and very minutely elevato-reticulated; petiole tomentose with fulvous hairs. Receptacle large, ovoid?, umbonate at the top, about 5-8cm. long, with numerous scales towards the mouth internally. Achene (*Fig. 2, mag.*) pedicellate, oblong-fusiform, narrowly oblong-fusiform, narrowly obovoid-oblong, or obovoid-oblong, scarcely oblique in form, attenuated on both ends, obtuse at the apex, acutely tapering below, often very shortly stipitate, smooth, 2-3½mm. long; style inserted above the middle on the lateral side of the achene, erect or ascending, exceeding the achene, elongately subulato-filiform altogether with a tapering stigma; endocarp (*Fig. 3, mag.*) fusiform, scarcely oblique in shape, obtuse at the apex, tapering at the base, smooth, pale when dried, 2¼-2⅔mm. long; sepals 3-6, unequal in length, lower than the achene, erect, spatulato-linear, obtuse or acute, entire, carinate dorsally, persistent, reddish ferruginous when dried; pedicel filiform, longer than the achene, pale, unequal in length, the longest one about 10mm.

Nom. Jap. *Aigyokushi-itabi* (愛玉子 イヌビ).

Hab. FORMOSA: Seimōju-shō in Dabyōtōtei-ho, Kagi-chō (嘉義廳下打猫東頂堡生毛樹庄).

This seems to me to be very closely allied to *Ficus Hanceana* Maxim. (= *F. stipulata* Hance), from which it differs by the leaves; it differs also from *F. pumila* Linn. by the leaves and achene. The figs cut in pairs and dried by the native are known under the name of *ok-gue* (*ai-yū-tze*), 愛玉子. The fruits secrete a pure jelly matter when soaked in water, which, with addition of sugar, supplies a peculiar refreshment called *aw-keo-tsang* (愛玉湯?). My specimens are due to the kindness of Mr. Yoshio Tanaka, a Member of the House of Peers.

Ficus (Eusyce) **pumila** Linn. Sp. Pl. p. 1060; Richt. Cod. n. 7725; Vahl, Enum. Pl. II. p. 190; Houtt. Linn. Pfl.-Syst. II. p. 546; Willd. Sp. Pl. IV. p. 1140; Ait. Hort. Kew. ed. 2, V. p. 487; Pers. Syn. Pl. II. p. 610; Rœm. et Schult. Syst. Veg. I. p. 506; Spreng. Syst. Veg. III. p. 780; Endl. Enchir. Bot. p. 166; Hance in Journ. Bot. (1866) p. 54; Miq. Prol. Fl. Jap. p. 131, ex parte?; Franch. et Sav. Enum. Pl. Jap. I. p. 435; Kanitz, Anthoph. Jap. p. 21; Maxim. in Mém. Biol. XI. p. 342; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 465; Henry, List Pl. Formos. p. 88; Diels in Engler's Bot. Jahrb. XXIX. p. 299; Bretschn. Hist. Eur. Bot. Disc. China, pp. 99, 111, 198.

Ficus pumila Thunb. Dissert. Fic. p. 9, n. 10; Walp. Ann. I. p. 720.

Plagiostigma pumilum Zucc. in Abh. Akad. Muench. IV. 1, p. 154, adn.

Ficus pumila var. *a.* Thunb. Fl. Jap. p. 33; Sieb. et Zucc. in Abh. Akad. Muench. IV. 3, p. 222.

Ficus stipulata Thunb. Dissert. Fic. p. 8, n. 7; Vahl, Enum. Pl. II. p. 184; Willd. Sp. Pl. IV. p. 1139; Rœm. et Schult. Syst. Veg. I. p. 501; Spreng. Syst. Veg. III. p. 779; Ait. Hort. Kew. ed. 2, V. p. 486; Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Gen. XII. n. 174; Sieb. et Zucc. in Abh. Akad. Muench. IV. 3, p. 222; Hoffm. et Schult. Nom. indig. Pl. Jap. in Journ. Asist. (1852) p. 294, n. 241; Walp. Ann. I. p. 720; Hook. fil. in Bot. Mag. tab. 6657; Bretschn. Hist. Eur. Bot. Disc. China p. 198.

Ficus stipulata Thunb.; Seem. Bot. Voy. 'Herald.' p. 413.

Plagiostigma stipulatum Zucc. in Abh. Akad. Muench. IV. 1, p. 154, adn.

Ficus erecta Auct. plur. non Thunb.

Tenorea heterophylla Gasp. 'Nov. Gen. Fici, p. 6, et Ricerche Sull. Nat. Caprif. e del Fico. p. 81, tab. 8, f. 22-31.'

Ficus scandens Lam. Enc. II. p. 498; Vahl, Enum. Pl. II. p. 184; Pers. Syn. Pl. II. p. 609; Rœm. et Schult. Syst. Veg. I. p. 500.

Ficus repens Hort. ex Hook. fil.

Inu Itabu Kæmpf. Amœn. Exot. p. 803, ic. p. 804.

Scandent, radicans, strong, ramose; fructiferous branches erect, densely leaved, terete, glabrous, pale cinereous, or fulvous, marked with nodal lines, under which with an annular series of lenticels; the young branchlet adpressed-tomentose with short ferruginous hairs. Leaves persistent, alternate, obovato-elliptical, ovato-elliptical, oblong-elliptical, elliptical, or narrowly ovato-oblong, obtuse at the apex, rounded or obtuse or acutish towards the base and often subcordate at the very base, entire with reflexed margin, coriaceous, glabrous above, thinly pubescent beneath, about 2-10½ cm. long, 1⅔-5½ cm. broad; midrib prominent beneath and impressed above as are veins; veins loose, erect-patent, 5-6 or 7 on each side, usually hardly arcuate upwards, continued before reaching the margin, the basal two opposite and triplinerved with the midrib, upper ones subopposite or alternate; veinlets minutely and densely



perforato-reticulated; petiole $\frac{1}{2}$ – $2\frac{2}{3}$ cm. long, tomentose with short ferruginous or fulvo-ferruginous hairs; stipules caducous, subulato-lanceolate, acuminate, adpressed-pubescent externally, shorter than the petiole. Receptacle large, $3\frac{1}{2}$ – $4\frac{1}{2}$ cm. long, peduncled, axillary, turbinato-globose or turbinate, somewhat flattened above, umbonate at the top and in its centre with close and piloso-pubescent scales, very shortly or not stipitate, adpressed-pubescent then subglabrate, green then nigro-purpureous, white-spotted but the spots become pale fulvous when matured, closely scaly at the mouth internally; peduncle terete, stout, tomentose or subtomentose with short ferruginous hairs, straight, or curved, provided with 3 small deltoid deciduous scales (adpressed-pubescent dorsally) at the top, 3–20 mm. long. Male-flowers superior near the mouth, filiform-pedicellate; sepals 4–5, spathulato-oblong, or obovate, rounded-obtuse, minutely ciliolate, sometimes slightly puberulent dorsally, pale; stamens 2, with very short filament; anther oblong, obtuse or acutish at the top, bifid at the base. Female-flowers (*Fig. 2, 3, mag.*) very shortly pedicellate; sepals longer than the ovary, erect, ruby; ovary orbiculato-oval; style ascending from the top of the ventral margin, nearly as long as the ovary; stigma dilated, peltate, concave, sometimes oblique. Achene (*Fig. 1, mag.*) filiform-pedicellate, globoso-ovoid, globoso-obovoid, or globose, rounded at both ends, smooth, sessile, ferruginous when dried, about 2– $2\frac{3}{4}$ mm. long; style very short, usually ascending, situated in the middle on a lateral side of the achene; stigma peltato-dilated, concave; pedicel usually longer than the achene, pale ferruginous, attaining about 5 mm. long; sepals usually 4–5, or 3, more or less unequal in length, about equal to or slightly longer than the achene, erect, deep reddish-ferruginous when dried, linear or subspathulato-linear, acute or obtuse, thickish towards the centre, carinate dorsally, 3– $3\frac{1}{2}$ mm. long.

Nom. Jap. *Ō-itabi*.

Hab. Prov. HIZEN: Nagasaki (Herb. ! Sc. Coll. Imp. Univ. Tokyo, May 1879), Hiu-mura (*Y. Kaneko!* Sept. 23, and Nov. 1904); Prov. ŌSUMI: Futakawa-mura in Minami-Ōsumi-gōri (*K. Watanabe!* herb. ibid. March 13, 1891); Prov. HIGO: Tomioka in Amakusa (*M. Murakami!* Dec. 2, 1904); Prov. KII (*C. Takenouchi!*); AMAMI ŌSHIMA (*T. Uchiyama!* herb. ibid. Dec. 3, 1900); FORMOSA: Daihoku (*T. Makino!* herb. ibid. Nov. 15, 1896).

Common in southern Japan. The achene secretes a jelly matter when soaked in water.

Ficus (Eusyce) **Hanceana** Maxim. in Mél. Biol. XI. p. 341; Bretschn. Hist. Europ. Bot. Disc. China, p. 634.

Ficus stipulata Hance in Journ. Bot. IV. (1866) p. 54, non Thunb.

The habit, stem and leaves quite similar to those of *Ficus pumila* Linn. Receptacle large, 3-4½cm. long, axillary, peduncled, subturbinate-globose, globose, or obovoid-globose, not stipitate, or hardly stipitate, somewhat flattened above, umbonate or hardly so at the top and in its centre with close and piloso-pubescent scales, adpressed-pubescent then subglabrate, green but nigro-purpureous when matured, white-spotted above and the spots then rufous (when matured); peduncle stout, terete, curved or straight, usually enlarged above, glabrate or thinly piloso-pubescent, with deltoid or ovato-deltoid 3 deciduous scales at the top, 7-18mm. long. Achene (Fig. 1, mag.) filiform-pedicellate, elongato-oblong, elongato-obovoid, elliptico-obovoid, obovoid-fusiform, or elongato-obovoid-fusiform, obtuse at the apex, attenuated below or slightly so, somewhat oblique in shape, about 3 mm. long; endocarp (Fig. 2, mag.) fusiform or obovato-fusiform, obtuse at the apex, somewhat tapering at the base, slightly oblique in form, smooth, pale when dried, 2-2½mm. long; style situated above the middle on the lateral side of the achene, ascending or hooked-ascending, sometimes reflexed, subulato-filiform with a tapering stigma, exceeding the achene; sepals 4, erect, unequal in length, elliptical to spatulato-oblong, obtuse or acute at the apex, hyalino-membranaceous towards the margin, carinate dorsally, much shorter than the achene, 1-2mm. long; pedicel longer than the achene.



Nom. Jap. *Wase-ōitabi* (nov.).

Hab. Prov. HIZEN: Hiu-mura (Y. Kaneko! Nov. 1904); FORMOSA: Daihoku (S. Nagasawa! 1904).

New to the Flora of Japan. Less common than *Ficus pumila* Linn. in southern Japan. The achene abundantly secretes a jelly matter when soaked in water, like that of *F. Avkeotsang* Makino. The fruit ripens in October and November, the mature period is earlier than in those of *F. pumila* Linn., the fruit of which is yet usually green in that time. This species is quite indistinguishable in sterile specimens from *F. pumila* Linn.

There are, before us, several specimens, which are quite sterile or bear very young receptacles, from Yaeyama Archipelago (*Y. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1887), Amami-Ōshima Archipelago (*Y. Tashiro!* herb. ibid. Sept. 1887), Itsube-mura in Amami-Ōshima (Herb. *!* ibid.), Sonoki in prov. Hizen (Herb. *!* ibid. Aug. 15, 1882), and Karatsu in Kita-matsuura-gōri of prov. Hizen (Herb. *!* ibid. Feb. 1, 1895); those will belong whether *F. pumila* Linn. or *F. Hanceana* Maxim., but I have nothing to say about them.

Above three species, which appear confused each other, are analytically keyed as following:—

- | | | |
|---|---|---|
| 1 | { | Achene oblong-fusiform; style filiform with a tapering stigma, exceeding the achene 2. |
| | | Achene globose; style very short, with a peltato-patelliform stigma, much shorter than the achene... <i>F. pumila</i> Linn. |
| 2 | { | Leaves ovato-elliptical, sparingly pale-pubescent beneath, 5-6-costate on each side <i>F. Hanceana</i> Maxim. |
| | | Leaves oblong-lanceolate, fulvo-pubescent beneath, about 8-10-costate on each side <i>F. Awkeotsang</i> Makino. |

Croomia kiusiana Makino sp. nov.

Croomia pauciflora Miq. Prol. Fl. Jap. p. 357; Franch. et Sav. Enum. Pl. Jap. II. p. 93, non Torr. et Gray.

Perennial, about 3-4 decim. high, glabrous. Rhizome subterranean, repent, slender, closely nodose, with truncate tubercles (which are the very base of old stems) situated in a little distance, loosely rooting but densely and fasciculatly so in the apical portion; roots stout-fibrous, spreading, strong, with rootlets towards the end. Stem simple, erect, slender, smooth, provided with 4-5 alternate sheaths at the base, foliate towards the top; sheaths adpressed, membranaceous, mucronato-obtuse or mucronato-retuse, entire, loosely pluri-nerved, the lowest one smallest, the uppermost one largest and 27-35mm. long. Leaves erect-patent, or subpatent, alternate, distichous, 5-6, shortly petioled, oblong-lanceolate to ovato-lanceolate, acuminate, rounded (not cordate) and slightly decurrent to the petiole at the base, subscabrous and subcrispulate on the entire margin, membranaceous, 5-9-costate, with delicate and closely placed transverse veinlets, 5-11 cm. long, 1½-4½ cm. wide; petiole 2-7mm. long; rachis 6-8 cm. long, narrow, slightly flexuous. Peduncle axillary, patent-nutant, simple or rarely geminate, filiform, much shorter than leaves. Raceme 2-4-flowered; rachis very short or obscure; bracts erect-patent or suberect, sessile, linear or subulato-

linear, acuminate, entire, 1-nerved, opposite to the pedicel, viridescent, the lowest one largest and attaining about 8 mm. long, often curved. Flower small, pedicellate, 7-9 mm. across, viridescent; pedicel capillary, much longer than the flower, attaining about 19 mm. in length, articulated in the middle, the upper portion more or less obconically enlarged under the flower. Sepals 4, patent, cruciate, ovato-oblong, obtuse, entire, reflexed on margin, obscurely 5-nerved, membranaceo-herbaceous, about $4\frac{1}{2}$ mm. long. Stamens 4, erect, inserted to the very base of sepals, shorter than sepals, nearly 3 mm. long; filament straight, thickish, linear, enlarged above and slightly so at base; anther oval, bilobed below and bifid above, introrse, at length become terminal and arcuately curved after the dehiscence; cells narrowly oblong; pollen globose or ovoid. Ovary small, depressed-ovoid-globose, viridescent, 1-locular, several-ovuled; stigma minute, terminal, sessile.

Nom. Jap. *Hime-nabewari* (nov.).

Hab. Prov. HIGO: Nanataki-mura in Kami-masuki-gōri (*H. Kami-dzuma!* April 25, 1904).

This species is very closely allied to *Croomia pauciflora* Torr. et Gray of North-America, from which it differs by the laxly alternate, short-petioled and not cordate leaves, angustate bracts, sepals with nerves, the rhizome with nodes.

Citrus Aurantium Linn. **subsp. Junos** (Sieb.) Makino in Bot. Mag., Tokyo, XV. (1901) p. 165, **forma verrucosa** Makino.

Branches dark, striate with pale-brown lines; branches trigono-compressed, deep green, glabrous; spine short. Leaves oblong-ovate or elliptical-ovate, shortly attenuated above and with an emarginate tip, obtuse or rounded-obtuse at the base, entire or scarcely crenate above, coriaceo-chartaceous, deep green and shining above, very slightly lighter beneath, pellucid-punctate, $3\frac{1}{2}$ -8 cm. long, 2- $4\frac{1}{3}$ cm. wide; petiole 6-20 mm. long, winged above, cuneato-oblancoleate. Fruit globose, somewhat depressed, about 4-5 cm. across, yellow, verrucose, broadly umbonate and concave in its centre at the top, with slightly concave oil-glands; rind thick, white and spongy interiorly, aromatic; pulp several-celled, with thin dissepiments, yellowish pale; vesicles fusiform, with an acid juice; persistent sepals green, deltoid or depressed-ovato-deltoid, acute. Seeds obovate, compressed; testa yellowish white, smooth, firm; tegmen membranaceous, slightly sub-rosy

internally at the chalaza; embryo 1 to a seed; cotyledons whitish or viridescent-white.

Nom. Jap. *Tokoyuzu*.

Hab. Prov. MŪSASHI: Tokyo, cult. (*T. Makino!* Jan. 1902, Dec. 1904).

This differs from the type of *subsp. Junos* (Sieb.), by its smaller and verrucose fruit."

CORRECTIONS.

Page 3, line 13, for "anatomosing" read: anastomosing.

„ 4, line 8, for "Pfl.-Eam." read: Pfl.-Fam.

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OBSERVATIONS ON THE FLORA OF JAPAN.

Fasciculus 5.

1905.

By

T. Makino,

*Assistant in the Botanical Institute, Science College,
Imperial University of Tokyo.*

Reprinted from the BOTANICAL MAGAZINE, Tokyo, Vol. XIX. 1905.

TOKYO

1905.

Observations on the Flora of Japan.*

Fasciculus V. 1905.

By

T. Makino,

Assistant in the Botanical Institute, Science
College, Imperial University of Tokyo.

ALL KNOWN SPECIES OF THE JAPANESE LISTERA.

LISTERA R. Brown in Ait. Hort. Kew. ed. 2, V. p. 201.

Analytical Key.

- 1 { Labellum entire (not cleft), linear-lanceolate, elongato-
linear above.....*L. japonica* Bl.
Labellum bifid.....2.
- 2 { Labellum: basal teeth none or obscure3.
Labellum: basal teeth well developed.....4.
- 3 { Labellum: lobes usually close (very rarely divergent);
basal teeth none. Leaves situated in the lower
portion of the whole plant.....*L. Savatieri* Maxim.
Labellum: lobes divergent; basal teeth very minute
and obscure. Leaves situated in the middle of the
whole plant.....*L. Yatabei* Makino.
- 4 { Labellum: lobes linear or lato-linear, few or sub-several-
nerved5.
Labellum: lobes short broad and oval, several or sub-
numerous-nerved.....*L. nipponica* Makino.
- 5 { Labellum. $5\frac{1}{2}$ - $8\frac{1}{2}$ mm. long; lobes lato-linear, obtuse or
acute and often pauci-dentate at the apex; basal
teeth turned towards the column and clasping it.....*L. shikokiana* Makino.
Labellum $2\frac{3}{4}$ - $3\frac{1}{2}$ mm. long; lobes linear, tapering towards
the apex; basal teeth spreading and curved for-
wards *L. cordata* R. Br.

Listera japonica Blume, Coll. Orchid. Archip. Ind. et Jap. p. 136,
tab. 38, fig. 2, et tab. 48, fig. E; Miq. Prol. Fl. Jap. p. 141; Makino in
Bot. Mag., Tokyo, VII. (1893) p. 66.

Diphryllum japonicum O. Kuntze, Rev. Gen. Pl. II. p. 659.

* BOTANICAL MAGAZINE, Tokyo, Vol. XIX. (1905).

Leaves deltoid. Labellum (*Fig. I. copied from Blume's original plate.*) not cleft, linear-lanceolate, 3-nerved towards the base, angustately elongato-linear with involute margin and 1-nerved above, cordato-sagittate and clasping the column at the base.

Nom. Jap. *Ō-futabaran* (T. Makino).

Hab. Japan (after Blume).

Not seen.



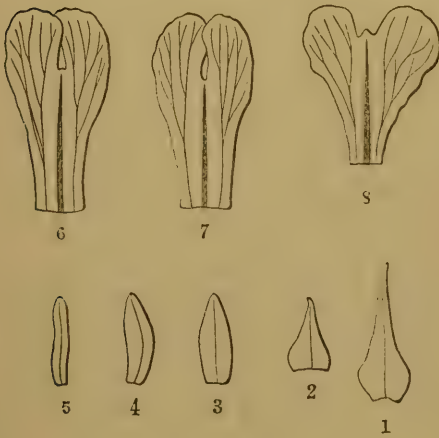
Listera Savatieri Maxim. ined. ex Komar. Fl. Manshur.

I. (1901) p. 526.

Listera Eschscholtziana Maxim. Prim. Fl. Amur. p. 269, ex Komar. l. c.; Makino in Bot. Mag., Tokyo, VII. p. 69, non Chamisso.

Listera japonica Franch. et Sav. Enum. Pl. Jap. II. p. 37, non Blume, fide Komar.

Whole plant 11–24 cm. in height. Rhizome filiform, long, creeping, subterranean, root-like, usually furnished with one or few new plants on it in a distance; roots loosely pauci-pluri-fasciculate at nodes near the stem, filiform, often with root-hairs. Stem erect, or ascending, slender-gracile, 1–6½ cm. long and glabrous below the leaves, but 7½–20½ cm. long (including the raceme) and pubescent with spreading glandular hairs above the leaves, provided with 2 thinly membranaceous adpressed sheaths at the base. Leaves 2, oppositely approximate (the superior one usually somewhat smaller), patent, situated in the lower portion of the stem, elliptico-



II ×5

ovate to orbiculato-ovate, or sub-deltoid-ovate, obtuse or acutish at the apex, broadly truncate and sometimes very shallowly subcordate below, triangularly and very slightly produced at the sessile base, entire and crispulate on margin, membranaceous, glabrous, green, often albescent along the main nerves on the upper surface, paler beneath, 12–38 mm. long, 11–29 mm. broad; main nerves 3 and moreover with 1 or sometimes 2 nerves between them and 1 nerve in their outsides, the outer one with an external branch;

veinlets delicate and loosely anastomosing; reduced leaves minute, squamiform, 4-9 or sometimes 12, very loosely disposed on the stem between the leaves and raceme, adpressed or erect-patent, or spreading, subulate or linear-subulate, long-acuminate, viridescens, thin, glabrous, 1-nerved, $1\frac{1}{2}$ -5 mm. long. Raceme erect, loosely 6-21-flowered; rachis filiform, straight, or subflexuous above, $2\frac{1}{2}$ -7 cm. long; bracts (*Fig. II. 1-2.*) erect-patent, adpressed to and apparently shorter than the pedicel, subulate, acuminate, 1-3 mm. long. Flowers small, viridescens with no trace of purple; pedicels erect-patent, gracile, puberulent or glabrous, 2-5 mm. long. Perianth erect-patent or recurvo-patent, equal in length, thinly membranaceous, 1-nerved, reflexed on margin, $2-2\frac{2}{3}$ mm. long. Sepals: the superior one (*Fig. II. 3.*) oblong-lanceolate, obtuse or acutish-obtuse; lateral ones (*Fig. II. 4.*) similar but slightly oblique in form. Petals (*Fig. II. 5.*) linear, very obtuse. Labellum (*Fig. II. 6-7.*) $2-2\frac{1}{2}$ -times the length of the perianth, narrowly obovato-cuneate, gradually attenuated below and without basal teeth, obcordate with oval or oval-ovate lobes (rounded at the apex and entire or obscurely crenulate on margin) and a closed sinus above, rarely obcordato-cuneate (*Fig. II. 8.*) with an open sinus and divergent oval lobes, often pointed with a minute depressed-deltoid or depressed-rounded projection in its bottom between lobes, $5-6\frac{1}{2}$ mm. long, 2-4 mm. wide in the upper broad portion, the median nerve thicker; veins which run into the lobes branched. Column $1\frac{2}{3}$ -2 mm. long, straight; clinandrium deeply concave, the dorsal edge obscurely crenulate; anther elliptical-ovate; rostellum broadly deltoid-ovate; stigma rounded. Ovary oblong or obconico-oblong, glabrous, $2-2\frac{1}{2}$ mm. long.

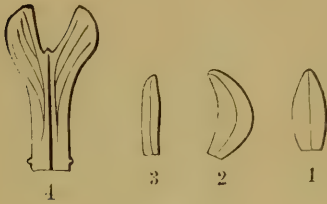
Nom. Jap. *Ao-futabaran* (T. Makino), *Futaba-ran*.

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* Aug. 28, 1887), Nanokawa (*K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 15, 1889); Prov. HITACHI: Mt. Tsukuba (*C. Owatari!* herb. *ibid.* July 25, 1895); Prov. SHIMOTSUKE: Nikkō (*H. Takeda!* Aug. 11, 1900; *T. Makino!* June 1901, and Aug. 1903), Nikkō? (*Herb.!* *ibid.* July 15, 1879); Prov. IYO: Nametoko (*Z. Umemura!* July 1896); Prov. IWASHIRO: Kaneda in Aidzu (*G. Nakahara!* July 1903).

Listera Yatabei Makino sp. nov.

Whole plant 16-19 cm. in height. Rhizome subterranean, creeping, filiform; roots filiform, with root-hairs. Stem erect, slender, glabrous below the leaves but above them pubescent with patent short glandular

hairs including the rachis of the raceme, with 2 membranaceous adpressed sheaths at the base. Leaves 2, placed in the middle of the whole plant, oppositely approximate, patent, orbiculato-subreniform, obtuse or acutish at the apex, broadly truncato-subcordate below and very slightly produced at the sessile base, entire and more or less crispulate on margin, membranaceous, glabrous, 18–25 mm. long, 25–30 mm. broad, 7-nerved, the outer nerve with an external branch; reduced leaves few (about 2), loosely disposed on the stem between leaves and raceme, adpressed or erect-patent, subulate, acuminate, squamiform, glabrous, viridescent, about $2\frac{1}{2}$ mm. long. Raceme erect, loosely about 11-flowered, about 4–5 cm. long; rachis filiform, straight;



III $\times 5$

bracts erect-patent, apparently shorter than pedicels, ovato-subulate, deltoid-subulate, or lato-ovate, acuminato-acute, membranaceous, 1-nerved, $1\frac{1}{2}$ –2 mm. long. Flowers small, luteo-viridescent?; pedicels erect-patent, gracile, pubescent, about $3\frac{1}{2}$ –4 mm. long. Perianth equal in length, obtuse, membranaceous, 1-nerved, about $2\frac{1}{3}$ mm. long. Sepals: the superior one (*Fig. III. 1.*) ovato-lanceolate; lateral ones (*Fig. III. 2.*) somewhat oblique in form, lanceolate-oblong. Petals (*Fig. III. 3.*) linear. Labellum (*Fig. III. 4.*) twice as long as the perianth, lato-linear below, divergent with 2 short-oblong obtuse and slightly oblique lobes above, with a minute point in the bottom of the open sinus, the median vein thick, veins which run to the lobes 3 and simple or sometimes forked; basal teeth very minute and obsolete. Column about 2 mm. long; anther lato-ovate, obtuse and very shortly bifid at the apex; rostellum orbicular; stigma roundish. Ovary oblong, glabrous, about 2 mm. long.

Nom. Jap. *Takane-futabaran* (nov.).

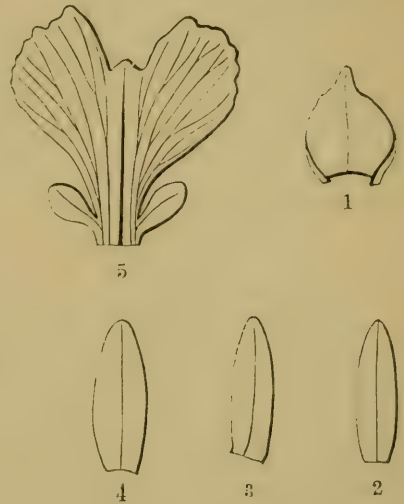
Hab. Prov. SHINANO: Mt. Ondake (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 27, 1880.); Prov. SHIMOTSUKE: Mt. Kōsei-tōge in Nikkō (*J. Matsumura!* herb. ibid. July 22, 1885).

This has a resemblance to *Listera puberula* Maxim. from Western China, but differing from it by the form of leaves and sepals, and the length of the labellum. It comes also near to *L. Savatieri* Maxim., but also differs from the latter by the form and position of leaves, and the form of the labellum.

Listera nipponica Makino sp. nov.

Whole plant 11–22 cm. high. Rhizome short, ascending or erect; roots filiform, with root-hairs. Stem erect, slender, glabrous below the leaves but above them pubescent with patent glandular hairs including the rachis of the raceme, provided with short, adpressed, membranaceous and remotely placed two sheaths at the base. Leaves 2, oppositely approximate, situated in the middle of the whole plant, patent, sessile, ovato-semiorbiculate, or subreniform-semiorbiculate, abruptly cuspidate at the apex, broadly truncate or truncato-subcordate and in centre very slightly produced at the base, minutely crispulate on the entire margin, glabrous, membranaceous, 13–25 mm. long, 10–31 mm. wide; main nerves 3, with a vein between main nerves and in their outsides; veinlets loosely anastomosing; reduced leaves none or only one, squamiform, ovato-subulate, membranaceous, 1-nerved. Raceme erect, loosely 3–9-flowered, 3–5½ cm. long; rachis gracile, often subflexuous; bracts (*Fig. IV. 1.*)

small, patulous or erect-patent, distinctly shorter than pedicels, ovato-subulate, membranaceous, glabrous, 1-nerved, 1½–5 mm. long. Flowers small, olivaceo-purpurascens?; pedicels gracile, erect-patent, glabrous or subpuberulent, 3–8 mm. long. Perianth equal in length, obtuse, membranaceous, 1-nerved, 3–4 mm. long. Sepals reflexed; the superior one (*Fig. IV. 2.*) oblong-lanceolate; lateral ones (*Fig. IV. 3.*) similar, but hardly oblique in form. Petals (*Fig. IV. 4.*) slightly broader than sepals, oblong. Labellum (*Fig. IV. 5.*) twice as long as the perianth, flabellato-obcordate with ovato-oval or



IV × 5

oval-elliptical rounded-obtuse often subrenulate divergent lobes, with a minute depressed-deltoid point in the bottom of open sinus, broadly cuneate below and shortly attenuated at the base, on each side near its base furnished with a small (1½–1½ mm. long.) obovato-elliptical or subspathulato-oblong obtuse tooth (turned upwards and parallel to the column), 5–6½ mm. long, 4½–6 mm. broad, flabellately veined, the median nerve thicker. Column 2–2½ mm. long, straight; clinandrium deeply concave, the dorsal edge thin and pauci-crenulate; anther lato ovate, obtuse; rostellum broad; stigma roundish. Ovary obovoid or obovoid-oblong, glabrous, 2–3 mm. long.

Nom. Jap. *Miyama-futabaran* (nov.).

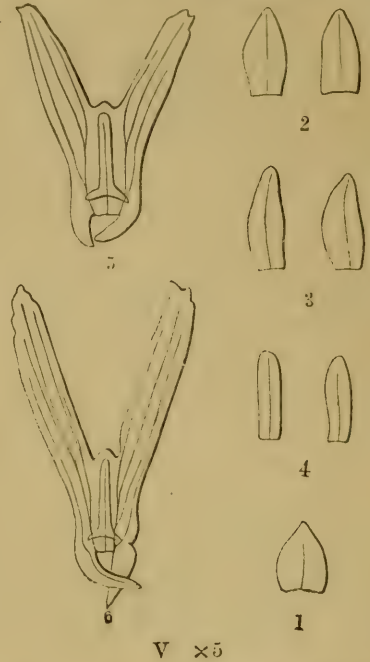
Hab. Prov. SHIMOTSUKE: Nikkō (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 31, 1877), Mt. Nyohō (*H. Takeda!* Aug. 18, 1901); Prov. SHINANO: Mt. Yatsugatake (*K. Tanaka!* Aug. 1902; *Y. Yabe!* herb. ibid. Aug. 19, 1902); Mt. Togakushi (*H. Takeda!* July 20, 1904); Prov. KAI: Mt. Kuroto in Kita-Komugōri (*H. Takeda!* Aug. 12, 1903); Prov. IWASHIRO: Mt. Iide (*G. Nakahara!* Aug. 1904).

This species is found in sub-alpine shady part of mountains. It differs apparently from *Listera puberula* Maxim., which has the patulous perianth, ovate sepals, linear-petals, linear-cuneate labellum 3-4-times as long as the perianth, and arcuate column; and also from *L. pinetorum* Lindl., which has the lato-deltoid leaves, very short raceme, larger flower, connivent perianth, ovate sepals, linear petals, and long and arcuate column. It approaches very much to *L. convallarioides* Nutt., but the latter has the orbicular-ovate obtuse leaves, cuneato-oblong emarginate or shortly 2-lobed labellum, and slender column. It is also distinguished from *L. Eschscholziana* Cham., which bears the foliaceous bracts subequal to pedicels, angustato-lanceolate acute perianth, narrower labellum, and the elongate column. *L. japonica* Bl. is easily distinguishable from my species by its deltoid leaves and entire (not cleft) labellum.

Listera shikokiana Makino in Bot. Mag., Tokyo, VII. (1893) p. 68.

Whole plant 5-17 cm. in height, flaccid. Rhizome filiform, ascending, short or rather long; roots long-filiform. Stem erect, purplish, subsacculent and glabrous below the leaves but above them thinly minutely glanduloso-pubescent including the rachis of raceme, with 2 to 3 very thinly membranaceous adpressed sheaths at the base, the upper sheath often slightly remote from the rest and 10-17mm. long. Leaves 2, oppositely approximate, situated usually above the middle of the whole plant, sessile, ovato-deltoid or deltoid, subcuspidato-acute or sharply acute at the apex, broadly truncate and sometimes subcordate below, abruptly and very shortly produced at the base, entire and crispulate on margin, membranaceous, glabrous, sometimes albescent along the midrib on the upper surface, 12-21 mm. long, 7-20 mm. broad, 3-nerved, with a vein between the main nerves and in their outsides, the outer vein often with an external branch; veinlets loosely anastomosing. Raceme erect, loosely 2-5-flowered; rachis 10-32 mm. long; bracts (*Fig. V. 1.*) small, much shorter than pedicels, broadly ovate, obtuse or acute, embracing the base of pedicels, thinly membranaceous, 1-nerved.

Flowers olivaceo-purpurascens; pedicels erect-patent, filiform, glabrous or very minutely and thinly puberulent, $3\frac{1}{2}$ –8 mm. long. Perianth reflexed, thin, 1-nerved, $2\frac{1}{3}$ –3 mm. long. Sepals obtuse; the superior one ovato-oblong (*Fig. V. 2.*); lateral ones (*Fig. V. 3.*) slightly oblique and oblong or oblong-lanceolate. Petals (*Fig. V. 4.*) about as long as sepals, spathulato-oblong or linear-oblong, quite obtuse, revolute on margin. Labellum (*Fig. V. 5-6.*) about $2\frac{1}{2}$ –3-times as long as the perianth, $5\frac{1}{2}$ – $8\frac{1}{2}$ mm. long, cuneate, sagittate, with a tooth on each side of the very base, divergently 2-fid above, with a minute depressed-deltoid obtuse point in the bottom of the deltoidly open sinus, narrowly and longitudinally elevated in centre; lobes narrow and lato-linear, acute or obtuse and often pauci-dentate at the apex, straight or straightish, delicately 3-6-nerved, 3–5 mm. long, 1 – $1\frac{1}{2}$ mm. broad; basal teeth oblong or oblong-lanceolate, obtuse or acutish, arcuate, turned upwards and clasping the column. Column very short, globose; clinandrium large, deeply concave; anther broadly ovate, obtuse, convex, sessile on the posterior side of the clinandrium; rostellum short, very slightly retuse; stigma horizontal, concave. Ovary obovoid, glabrous, 2–3 mm. long. Flowers April–May.



Nom. Jap. *Murasaki-futabaran*, *Hime-futabaran* (T. Makino).

Hab. Prov. TOSA: Nanokawa (*K. Watanabe!* herb. Sc. Coll. Imp. Univ. Tokyo, April 8, 1890; herb. T. Makino, April 17, 1890); Prov. UZEN: Mt. Yonai-zaka in Nishi-tagawa-gōri (*T. Nagasawa!* April 21, 1894), Shady hill on coast in Nishi-tagawa-gōri (*T. Nagasawa!* April 27, 1894); Prov. YAMATO: Mt. Kasuga (*Y. Yamada!* herb. H. Takeda, May 12, 1904).

Rare. Well-marked species among Japanese *Listera*. It has more or less an affinity to *Listera cordata* R. Br.

Listera cordata (Linn.) R. Brown in Ait. Hort. Kew. ed. 2, V. p.

201 ; Lindl. Gen. et Sp. Orchid. Pl. p. 456 ; Chamisso in Linnæa, III. p. 33 ; Reichb. Fl. Germ. Excurs. p. 133 ; Hook. Fl. Bor.-Amer. II. p. 204 ; Ledeb. Fl. Ross. IV. p. 80 ; Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 603 ; Blume, Coll. Orchid. Archip. Ind. et Jap. p. 136 ; Maxim. Prim. Fl. Amur. p. 269 ; Fr. Schm. Reis. im Amur. u. Ins. Sachal. pp. 63, 183 ; Nyman, Syl. Fl. Eur. p. 354 ; Boswell Syme, Engl. Bot. ed. 3, IX. p. 120, tab. 976 ; A. Gray, Man. Bot. ed. 5, p. 506 ; Wood, Cl.-Book Bot. p. 688, et Amer. Bot. et Fl. p. 329 ; Benth. Handb. Brit. Fl. ed. 5, p. 438, et Ill. Brit. Fl. ed. 5, p. 239, no. 990 ; Hook. fil. Stud. Fl. Brit. Isl. ed. 3, p. 386 ; Miq. Prol. Fl. Jap. p. 141 ; Franch. et Sav. Enum. Pl. Jap. II. p. 36 ; Makino in Bot. Mag., Tokyo, VII. p. 66 ; Finet in Bull. Soc. Bot. France, XLVII. (1900) p. 271.

Ophrys cordata Linn. Sp. Pl. p. 946 ; Richt. Cod. n. 6846 ; Houtt. Nat. Hist. XXX. (1780) p. 511, et Linn. Pl.-Syst. XI. (1784) p. 602 ; Michx. Fl. Bor. Amer. II. p. 158.

Epipactis cordata All. 'Fl. Redem. II. p. 152' ; Sw. 'in Vet. Acad. Nya Handl. Stockh. (1800) p. 232' ; Willd. Sp. Pl. IV. p. 88 ; Pers. Syn. Pl. II. p. 513 ; Wahlenb. Fl. Lapp. p. 219.

Neottia cordata Rich. 'in Mém. Mus. Par. IV. (1818) p. 59' ; Spreng. Syst. Veg. III. p. 707.

Cymbidium cordatum Londes. 'in Mém. Soc. Nat. Mosc. I. (1811) p. 282'.

Diphryllum cordatum O. Kuntze, Rev. Gen. Pl. II. p. 659.

Lobelia futatsbagusa Sieb. herb. ex Blume l. c.

Flowers minute. Sepals (*Fig. VI. 1, superior ones; 2, lateral ones.*) ovato-oblong, oblong, or elliptical-oblong, obtuse, $1\frac{1}{2}$ - $1\frac{2}{3}$ mm. long. Petals (*Fig. VI. 3.*) equal to sepals in length, oblong, rounded-obtuse. Labellum (*Fig. VI. 4-6.*) twice as long as sepals, cuneate, provided with a small falcate tooth on each side near the base, divergently 2-cleft, with a minute point in the bottom of the deltoid sinus, 3-nerved ; lobes linear, gradually acuminate.

Nom. Jap. *Futatsuba-gusa*, *Futatsuba-ron*, *Ko-futabaran*.

Hab. Prov. SHIMOTSUKE : Nikkō (*J. Matsu-*



mura! herb. Sc. Coll. Imp. Univ. Tokyo), Misawa in Nikkō (*K. Sawada!* herb. *ibid.* June 14, 1878), Mt. Nyohō in Nikkō (*H. Takeda!* Aug. 18, 1901, July 20, 1902); Prov. SHINANO: Mt. Komagatake (*R. Yatabe!* herb. *ibid.* July 27, 1880), Near Honzawa on Mt. Yatsugatake (*H. Takeda!* July 26, 1903); Prov. TOSA: Mt. Kuishi (*S. Yano!* June, 8, 1889); Prov. IWASHIRO: Mt. Iide (*G. Nakahara!* Aug. 1904); Mt. Adzuma (*G. Nakahara!* June 1904); Prov. UZEN: Mt. Katta (*G. Nakahara!* June 25, 1904).

The smallest one among the Japanese *Listera*.

***Calypso bulbosa* (Linn.) Reichb. fil. var. *japonica* (Maxim.) Makino.**

Calypso japonica Maxim. ex Komar. Fl. Manshur. I. (1901) p. 533, in nota.

Calypso bulbosa Makino in Bot. Mag., Tokyo, XVI. (1902) p. 177, non Reichb. fil., excl. syn.

A beautiful orchid, all the parts larger than the type. Leaves solitary, petiolate; blade spreading, ovato-elliptical, obtuse or subcordate at the base, plicate, crispate, green above, purple beneath, 7-nerved, attaining about $4\frac{1}{2}$ cm. long, $2\frac{1}{2}$ cm. broad. Scape clothed with long sheaths for the greater part; bract angustate, acuminate. Flower solitary, terminal, large and showy, drooping. Perianth nearly equal, linear-lanceolate, acuminate, spreading, ascending, rose-coloured, about $2\frac{1}{2}$ cm. long. Labellum large, inflated, saccate, pendent, about 3 cm. long, darkish-striato-punctate on the pale dorsal surface, yellow in the projecting bifid point; lamina dilated, shorter than the point, white-rosy, with a tuft of densely barbate yellow hairs and a few brown spots at the base. Column broadly winged, convex, rounded, petaloid, rose-coloured; anther inserted just below the apex. Ovary narrowly clavate, pedicellate.

Nom. Jap. *Hotei-ran* (Ventricous Orchid).

Hab. Prov. SURUGA: Mt. Fuji; Prov. SAGAMI: Hakone; Prov. RUKU-CHŪ: Nambu (*Chōnosuke* [*Tschonoski*] *Sugawa*, 1865-66).

Rare. I have seen only on figures.

***Goodyera Schlechtendaliana* Reichb. fil. in Linnæa, XXII. (1849)** p. 861; Walp. Ann. III. p. 597; Miq. Prol. Fl. Jap. p. 141; Franch. et Sav. Enum. Pl. Jap. II. pp. 38, 519; Maxim. in Mém. Biol. XII. p. 927; Makino, Ill. Fl. Jap. I. n. 6 (1890), p. 3, tab. 39; Diels in Engler's Bot. Jahrb. XXIX. p. 269; Rolfe in Journ. Linn. Soc. XXXVI. p. 46.

Orchiodes Schlechtendalianum O. Kuntze, Rev. Gen. Pl. II. p. 675.

Goodyera japonica Bl. Coll. Orchid. Archip. Ind. et Jap. p. 38, tab. 9, fig. 1, et tab. 11, fig. C (1853).

Goodyera secundiflora Griff. Notul. Pl. Asiat. III. p. 393; Ic. Pl. Asiat. tab. 347, fig. 2; Lindl. in Journ. Linn. Soc. I. (1857) p. 182; Hook. fil. Fl. Brit. Ind. VI. p. 113.

Orchiodes secundiflorum O. Kuntze, l. c.

Nom. Jap. *Miyama-udzura*, *Kamome-ran*.

Hab. Japan, not uncommon.

forma similis (Bl.) Makino.

Goodyera similis Bl. Coll. Orchid. Archip. Ind. et Jap. p. 39, tab. 9, fig. 2, et tab. 11, fig. D; Franch. et Sav. Enum. Pl. Jap. II. p. 520; Diels in Engler's Bot. Jahrb. XXIX. p. 269.

Neottia repens Buerger herb. ex Bl. l. c. p. 39, non Swartz.

Goodyera repens Miq. Prol. Fl. Jap. p. 141; Franch. et Sav. Enum. Pl. Jap. II. p. 38 (excl. p. 520?), non R. Brown.

Nom. Jap. *Funashi-miyamaudzura* (nov.).

Hab. Japan, rare.

Goodyera repens (Linn.) R. Br. is also found in Japan, bearing the albo-variegated leaves; its all parts are nearly similar to those of *G. Schlechtendaliana* Reichb. fil., but it is always easily distinguished from the latter by the not hairy saccate base of the labellum and the smaller size in every respect. There are specimens from Mt. Fuji, prov. Suruga (*I. Nagashima* and *K. Gotō!* Sept. 3, 1900), Nikkō, prov. Shimotsuke (*T. Makino!* Aug. 1903), Mt. Komagatake, prov. Shinano (*R. Yatabe!* Aug. 3, 1880; *K. Tanaka!* Sept. 25, 1902; *Y. Yabe!* Aug. 14, 1903), and Mt. Yatsugatake, prov. Shinano (*Y. Yabe!* Aug. 18, 1902).

Cymbidium alborubens Makino in Bot. Mag., Tokyo, XVI. (1902) p. 11. = **Cymbidium** (Eucymbidium) **Simonsianum** King et Pantling in 'Journ. As. Soc. Beng. LXIV. pars 2, (1895) p. 338', et 'in Ann. Bot. Gard. Calcutta, VIII. (1898) p. 188, tab. 250'; Hook. fil. in Curtis's Bot. Mag. tab. 7863 (1902).

Cymbidium Dayanum Hort. ex Hook. fil. l. c.

Pollinia subdeltoid-ovoid, with a fissure on the inner side.

This orchid has been cultivated in this country for many years.

It is figured under the name of *Hō-ran* in Iinuma's *Sōmoku-Dzusetsu*, vol. XX., published forty-nine years ago (1856).

Eleocharis tetraquetra Nees, 'in Wight, *Contrib. Bot. Ind.* p. 113', in *Linnaea* IX. p. 294; Kunth, *Enum. Pl.* II. p. 150; Steud. *Syn. Pl. Cyper.* p. 78; F. Muell. *Fragm. Phyt. Austral.* VIII. p. 239; Benth. *Fl. Austral.* VII. p. 294; Clarke in Hook. *fil. Fl. Brit. Ind.* VI. p. 630.

Heleocharis tetraquetra Boeckl. in *Linnaea*, XXXVI. p. 447.

Limnochloa tetraquetra Nees 'in Wight, *Contrib. Bot. Ind.* p. 113.'

Scirpus tetraquetrus O. Kuntze, *Rev. Gen. Pl.* II. p. 757.

Eleocharis erythrochlamys Miq. *Fl. Ind. Bat.* III. p. 300.

Culm quadriquetrous. Glumes many-spiral. Setæ lower than the rostrum (style-base) in height. Style base broadly ovato-deltoid, mucronato-obtuse, shorter than the achene.

Nom. Jap. *Mashikaku-i*, *Shima-shikaku-i* (nov.).

Hab. AMAMI ŌSHIMA: Ariya-mura (*Kimei Fudzino!* Sept. 9, 1904).

var. β. Wichurai (Boeckl.) Makino.

Heleocharis Wichurai Boeckl. in *Linnaea* XXXVI. (1869-70) p. 448.

Scirpus Wichurai Franch. et Sav. *Enum. Pl. Jap.* II. p. 544, non

Boeckl.

Scirpus hakonensis Franch. et Sav. l. c. p. 110.

Scirpus Onoei Franch. et Sav. l. c. p. 110.

Scirpus yokohamensis O. Kuntze, *Rev. Gen. Pl.* II. p. 758.

Heleocharis tetraquetra Boeckl. in *Engler's Bot. Jahrb.* VI. p. 51.

? *Scirpus petasatus* Maxim. in *Bull. Soc. Nat. Mosc.* LIV. (1879) p. 64.

Culm compresso-quadriquetrous, compresso-triquetrous, compresso-subquadriquetrous, or sometimes quadriquetrous. Glumes several-spiral, larger. Setæ equal to the rostrum (style-base) in height. Style-base elongato-conico-deltoid, or elongato-ovato-deltoid, tapering above, equal to or slightly longer or hardly shorter than the achene.

Nom. Jap. *Shikaku-i*.

Hab. Prov. TOSA: Takaoka-gōri (*T. Makino!* 1885), Sakawa (*T. Makino!* July 14, 1889; *T. Makino!* herb. Sc. Coll. Imp. Univ. Tokyo, 1884); Prov. IYO: Near Matsuyama (*Z. Umemura!* July 4, 1897); Prov. HYŪGA: Near Tsuno (*R. Yatabe* and *J. Matsumura!* herb. ibid. July 26, 1882); Prov. BUZEN: Foot of Mt. Iwadake (*R. Yatabe* and *J. Matsumura!* herb. ibid. July 20, 1882); Prov. TSUSHIMA: Neo-saka in Shimoshima (*Y. Yabe!* herb. ibid. July 22, 1901); Prov. SŪŌ: Yata in Ūchi-mura (*D. Nihai!*

herb. *ibid.* Oct. 4, 1891); Prov. MUSASHI: Nerima (*R. Yatabe* and *J. Matsumura*! July 4, 1880), Wada-mura (*R. Yatabe* and *J. Matsumura*! July 6, 1879); Prov. MIKAWA: Takashi-mura (*T. Makino*! herb. *ibid.* Oct. 28, 1894), Ōshima in Higashi-kamo-gōri (*G. Nagura*! July 4, 1896); Prov. ECHIGO: Mt. Shimidzu-tōge (*R. Yatabe* and *S. Ōkubo*! herb. *ibid.* July 1887; *T. Makino*! Sept. 1888); Prov. SHINANO: Mt. Wada-tōge (*R. Yatabe* and *J. Matsumura*! July 23, 1880); Prov. RIKUCHŪ: Mt. Kurikoma (*T. Makino*! Aug. 1890); Prov. IWASHIRO: Near Wakamatsu (*J. Matsumura*! herb. *ibid.* Aug. 5, 1879); Prov. MUTSU: Tokiwano (*T. Iwakawa*! herb. *ibid.* July 28, 1880); Prov. SHIMOTSUKE: Nikkō (*R. Yatabe*! herb. *ibid.* Aug. 1, 1877), Akanuma-no-hara in Nikkō (*T. Makino*! Aug.-Sept. 1903).

Common. As diagnosed above, this differs from the type.

Rynchospora (Dichostyleæ) **Umemuræ** Makino in Bot. Mag., Tokyo, XVII. (1903) p. 187, tab. 7, fig. 8, a. b.

Setæ antrorsely scabrous.

var. Hattoriana Makino.

Rynchospora Hattoriana Makino l. c. p. 189, tab. 7, fig. 11.

Setæ retrorsely scabrous.

Viola chærophylloides (Regel).

Viola pinnata var. *chærophylloides* Regel, Pl. Radd. I. p. 222; Maxim. in Mém. Biol. IX. p. 718; Franch. et Sav. Enum. Pl. Jap. II. p. 646.

Viola pinnata var. *dissecta* Miq. Prol. Fl. Jap. p. 84; Franch. et Sav. l. c. I. p. 40, non Turcz. nec Regel.

Viola pinnata Franch. et Sav. l. c. II. p. 291 (in conspectu specierum), non Linn.

Nom. Jap. *Ezo-sumire*, *Eizan-sumire*, *Kakure-mino*.

Hab. Japan, widely distributed.

forma simplicifolia Makino nov.

Leaves long-petiolate, simple, or sometimes shortly subbifid above, ovate, obtuse, cordate at the base, crenulato-serrulate, about 5–6 cm. long, 3–4 cm. broad; veins loose, pinnate or subpalmato-pinnate. Flower and fruit as in the type.

Nom. Jap. *Hitotsuba-azosumire* (nov.).

Hab. Prov. SHIMOTSUKE: Nikkō (*T. Makino!* Oct. 17, 1904, cult. by B. Ioki).

Rare.

Mitella (*Mitellaria*) **japonica** Miq. **var. integripetala** Makino nov. var.

Leaves oval-ovate, deeply cordate with a close sinus, acute or subacute, shallowly lobate with depressed-ovato-deltoid dentate lobes, very thinly pilose or subglabrous, dark-green along the nerves. Petal simple, subulato-filiform, smooth, recurved-reflexed, reddish above. Stigma semiorbicular, 2-4-lobulate, red. Flowers in April.

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* May 9, 1904).

This differs from the typical one of *Mitella japonica* Miq., which has pinnate petals.

Saxifraga (*Diptera*) **nipponica** Makino in Bot. Mag., Tokyo, XV. (1901) p. 10.

Perennial, constantly estoloniferous. Rhizome epigæous, glabrous, bay, thick, cylindrical, long-creeping, radican, di-trichotomously divaricato-ramose (the branches dividing from the apical portion of older rhizome), but sometimes short and erect or ascending with very short few branches and dense roots. Radical leaves tufted at the apical end of branches of rhizome, long-petiolate, spreading or erect, orbicular to orbiculato-reniform, cordate with an open or closed sinus at the base, shallowly or obscurely many-lobate with sharply and coarsely pauci-pluri-dentate or dentato-serrate (teeth deltoid or depressed-ovato-deltoid in shape) lobes, ciliated, dispersed with erect or suberect pilose hairs above, thinly pubescent or glabrous beneath, flaccid-herbaceous, green, 2-6 cm. long, $2\frac{1}{2}$ -7 cm. broad, palmately veined; petiole semiterete or compresso-terete, patently pilose or glabrous, viridescent, 3-16 cm. long, vaginato-dilated and villosa-ciliated at the base; cauline leaves much reduced in size, shortly vaginato-dilated at the base, remotely placed, usually 2 to 4, bract-like, linear, entire, sharply tipped, 7-13 mm. long, or sometimes the lowest one with a small (about 8 mm. long) flabellato-orbicular pauci-dentate and petiolate blade. Scape erect, much exceeding the leaves and attaining about 30 cm. in height including the panicle, slenderly terete, piloso-pubescent with spreading glandular hairs as are the rachis, peduncles, and pedicels. Panicle loose, ovato-pyramidal or elliptical,

7-15 cm. long, 6-12 cm. across; rachis slightly flexuous or only the upper portion so; bract subtending the peduncle, subulato-linear, sharply pointed, dilated and pauci-inciso-serrulate at the base, 5-10 mm. long; peduncles spreading, stout-filiform, nearly strict, loosely branched into 1-4-pedicels, with a minute linear or subulate bracteole opposite to the pedicels; pedicels filiform, attaining about 2 cm. long. Calyx 5-parted, herbaceous, viridescens, dispersed and ciliated with minute glandular hairs, persistent and slightly increasing the size in fruit; tube short, adherent to the base of the ovary, flatly depressed; sepals unequal in size and larger in the lower ones, patent and then more or less reflexed, ovato-lanceolate or subulato-lanceolate, obtuse or acute at the apex, with 3 nerves connected in the upper portion, the lowest one about $3\frac{1}{2}$ - $4\frac{1}{2}$ mm. long and the upper ones about $2\frac{1}{2}$ -3 mm. long in flower. Petals 5, white, thin; the lower 2 much larger, pendulous, apparently unequal in size, linear or linear-lanceolate and often somewhat falcate, gradually attenuated towards both ends, acuminate with an acute tip, sessile, entire, with veins running upwards, the larger one about $1\frac{1}{3}$ -2 cm. long and the other $1\frac{1}{5}$ - $1\frac{1}{2}$ cm. long; the upper 3 patent, broadly ovate, acute or apiculate at the apex, rounded and very shortly unguiculate at the base, entire, obscurely loose-veined, yellow in the basal portion. Stamens 10, patent, longer than the upper petals, glabrous; filament linear-filiform, attenuated towards the base, about equal to or longer than sepals in length, 4-5 mm. long; anther minute, ovato-oval, light rose. Ovary broadly ovoid, divided into 2 parts above and attenuated to the styles, glabrous, yellow and nectariferous on the upper side; styles 2, erect, gracile, shorter than the ovary; stigma minute, obliquely subcapitate; ovules numerous, minute, oblong. Capsule broadly conico-ovoid, about 4 mm. long, the upper half divergent with gracile persistent styles. Seeds minute, numerous, ellipsoid, darkish brown, dispersed with minute sessile dark granules. Flowers April-June.

Nom. Jap. *Haru-yukinoshita* (Spring Saxifraga).

Add. Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino!* May 1904); Prov. HIDA: Yamaguchi in Ōno-gōri, spont. (*T. Sakane!* no. 155, 1904); Prov. ETCHŪ: Sasahara-mura, spont. (*Y. Hasegawa!* no. 35, May 7, 1904).

Drosera spathulata Labill. 'Nov. Holl. Pl. Spec. I. (1804) p. 79, tab. 106, fig. 1'; Schult. Syst. Veg. VI. (1820) p. 762; DC. Prodr. I. (1824) p. 318; Spreng. Syst. Veg. I. (1825) p. 955; Planch. in Ann. Sc. Nat. Sér. 3, IX. (1848) p. 193; Bot. Mag. tab. 5240; Hook. fil. Handb.

N. Zeal. Fl. p. 63; Benth. Fl. Austral. II. p. 459; O. Kuntze, Rev. Gen. Pl. I. p. 233.

Drosera propinqua R. Cunn. 'in Ann. Nat. Hist. IV. (1840) p. 109.'

Drosera Loureirii Hook. et Arn. Bot. Beech. Voy. (1841) p. 167, tab. 31; Benth. Fl. Hongk. p. 130, et Fl. Austral. II. p. 460, in nota sub *D. spathulata*; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 289.

Drosera Brumanni DC. Prodr. I. p. 318, quoad sp. chinense, non Vahl.

Drosera Brumanni Catalog. Herb. Coll. Soc. Imp. Univ. Tokyo (1886), p. 70; Ito et Matsum. Tent. Fl. Lutch. I. p. 202, non Vahl.

Perennial. Leaves rosulate (the tuft attaining 4 cm. across), spreading, numerous, the blade spathulato-rounded or broadly obovato-rounded, cuneately passed into the lato-linear petiole, which is longer than the blade and densely pilose with scarious hairs at the base, rounded at the apex, pilose with glandular red unequal hairs above, subglabrous beneath, 2-6 mm. across, 8-20 mm. long including the petiole. Scapes 1-4, erect, slender, 5-20 cm. long including the raceme, minutely papillose. Raceme simple or rarely dichotomous, secundly few-many-flowered, circinate at first and then erect straight and angustate, shorter than the scape; rachis filiform, minutely papillose; bracts minute, filiform. Flowers about 3-4 mm. across, pedicellate, pink red; pedicel erect after anthesis, shorter than the flower, minutely papillose. Calyx 3 mm. long, campanulate, 5-parted, minutely papillose; segments oblong or oblong-lanceolate, tapering. Petals 5, narrowly obovate, longer than the calyx. Stamens 5, scarcely longer than the calyx; anther yellow. Ovary obovoid-globose; styles 3, deeply parted into 2 filiform branches, longer than the ovary. Capsule obovoid-globose, shorter than the persistent calyx, dehiscent to 3 1-placentiferous elliptical valves. Seeds oblong-fusiform, reticulated. Flowers May-October.

Nom. Jap. *Ko-mōsengoke*.

Hab. LOOCHOO: Ōgiimi-magiri in Isl. Okinawa (*Y. Tashiro!* herb. Sc. Coll. Imp. Univ. Tokyo, April 1887), Near Yontanzan in Isl. Okinawa (*S. Tanaka!* herb. ibid. May 15, 1891); Prov. TOSA: Kosaidzuno in Hata-gōri (*T. Makino!* Oct. 1885), Saga (*T. Makino!* Oct. 1885); Prov. KII: Tanabe aud Atawa (*J. Matsumura* and *S. Ōkubo!* herb. ibid. July 23, 1883); Prov. MIKAWA: Hosotani-mura (*T. Makino!* herb. ibid. Oct. 28, 1894), Takashi-mura (*T. Makino!* Oct. 28, 1894), Near Futakawa (*T. Makino!* Oct. 1894), Kaifuku (*G. Nagura!* June 25, 1900); Prov. KADZUSA: Hama-no-shiba (Herb. ibid. Aug. 13, 1880), Ichinomiya (*T. Makino!* Aug. 12, 1897, July 5, 1902); Prov. SUŌ: Ōuchi-mura (*D. Nikai!* herb. ibid. June 26, 1892); Prov. TŌTŌMI: Nobe-mura (*M. Hisamatsu* and *Y.*

Masuda ! herb. *ibid.* May 1889 ; FORMOSA : Daihoku (*C. Yoshihara* ! no. 124).

This differs from *Drosera Burmanni* Vahl, which has 5 undivided and filiform styles.

Drosera Burmanni Vahl, 'Symb. III. p. 56' ; Willd. Sp. Pl. I. p. 1544 ; Pers. Syn. Pl. I. p. 337 ; Don, Prodr. Fl. Nepal. p. 212 ; Spreng. Syst. Veg. I. p. 955 ; DC. Prodr. I. p. 318 ; Roxb. Fl. Ind. II. p. 113 ; Schult. Syst. Veg. VI. p. 760 ; Wight, Ic. Pl. Ind. Orient. tab. 944, et Ill. tab. 20 ; Wight et Arn. Prodr. Fl. Pen. Ind. Or. I. p. 34 ; Miq. Fl. Ind. Bat. I. 2, p. 120 ; Planch. in Ann. Sc. Nat. Sér. 3, IX. p. 190 ; Hook. fil. et Thoms. in Journ. Linn. Soc. II. p. 82 ; Benth. Fl. Hongk. p. 129, et Fl. Austral. II. p. 459 ; Oliv. Fl. Trop. Afr. II. p. 402 ; Clarke in Hook. fil. Fl. Brit. Ind. II. p. 424 ; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 288 ; Henry, List Pl. Formos. p. 42.

Drosera rotundifolia Lour. Fl. Cochinch. p. 232, non Linn.

Perennial. Leaves rosulate (the tuft about 3 cm. across), spreading, obovato-orbicular, shortly cuneate to a not long petiole, fringed with long glandular hairs and pilose with shorter glandular hairs above, thinly puberulent beneath, 6-7 mm. across, 10-14 mm. long including the petiole ; petiole about as long as the blade, fringed with scarious pilose hairs at the base. Scapes 1-3, erect, slender, glabrous, about 10 cm. long including the raceme. Raceme shorter than the scape, secundly several-flowered ; rachis glabrous ; bracts minute, linear, minutely papillose, pauci-fimbriate at the base. Flower about 6 mm. long, pedicellate, white ; pedicel shorter than the flower, glabrous. Calyx deeply 5-parted, sparsely minutely papillose, 4 mm. long ; segments erect-patent, oblong, rounded-obtuse. Petals 5, longer than the calyx, obovato-cuneate, attenuated into an unguis below. Stamens 5, shorter than the calyx ; filament subulato-filiform. Ovary globose, 1-celled, with 5 placentas, many-ovuled ; styles 5, undivided, long, filiform, curved upwards, with the fringed stigma at the end. Flowers summer.

Nom. Jap. *Kurumaba-mōsengoke* (nov.).

Hab. FORMOSA : Near Daihoku (*Chiyokichi Yoshihara* ! no. 143, April 1902).

So far as I know, this species has been found nowhere in Japan, except in Formosa ; while *D. spathulata* Labill. = *D. Louveirii* Hook. et Arn. (Jap. *Ko-mōsengoke*) are frequently met with. According to Forbes and Hemsley, Carpenter collected it in Amami Ōshima, but we have no specimen of it from there.

Drosera longifolia Linn. Sp. Pl. p. 282; Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 78; Ledeb. Fl. Ross. I. p. 261; Regel, Pl. Radd. I. p. 258; Hillebr. Fl. Hawai. Isl. p. 122; Makino in Bot. Mag., Tokyo, XIV. p. 33.

Rorella longifolia All 'Fl. Pedem. II. p. 88 (1785)'.

Drosera anglica DC. Prodr. I. p. 318; Engl. Bot. tab. 869; Hook. Fl. Bor.-Amer. I. p. 81; Torr. et Gray, Fl. N. Amer. I. p. 146.

Drosera americana Willd. Enum. Pl. Hort. Bot. Berol. (1809) p. 340.

Perennial. Leaves tufted, erect, long-petioled, attaining about 14 mm. long including the petiole, the blade shorter than the petiole, spathulato-linear, rounded-obtuse at the apex, gradually attenuated below and passing into the petiole, pilose with patent glandular long red hairs above, glabrous beneath, 1-3½ cm. long, 2-4 mm. wide; petiole slender, villose with scarious hairs at the base. Scape erect, straight, slender, glabrous, longer than the leaves, about 13-21 cm. long including the raceme. Raceme shorter than the scape, secundly about 3-8-flowered, circinate before anthesis; rachis glabrous; bracts minute, filiform. Flowers about 5-7 mm. across, pedicellate, white; pedicel erect, glabrous, 2-6 mm. long. Calyx campanulate, 5-parted, nearly glabrous, 4-5 mm. long; segments oblong, acutish-obtuse, laxly minutely glandulous on the margin. Petals 5, cuneato-spathulate, rounded at the apex. Stamens 5, longer than the calyx; filament filiform; anther rounded. Ovary cylindrico-ellipsoid; styles 3, deeply parted into 2 long, filiform branches, nearly as long as the ovary. Capsule scarcely longer than the persistent calyx in height, cylindrico-ellipsoid, dehiscent into 3 1-placentiferous valves. Seeds numerous, subspathulato-oblong, compressed, 1- nearly 2 mm. long; embryo oblong, ½ as long as the testa. Flowers July-August.

Nom. Jap. *Nagaba-no-mōsengoke*.

Hab. Prov. IWASHIRO: Ose-daira (*B. Hayata!* July 3, 1898, July 30, 1903; *K. Nemoto!* Aug. 1899; *D. Hoshi!* Aug. 1903; *G. Nakahara!* July 1903, Aug. 1904); Prov. CHISHIMA (KURIL ISL.): Mt. Atoiya in Isl. Etrof (*T. Kawakami,* Aug. 11, 1898).

Rare in Japan. It was first discovered and collected by Mr. Bunzō Hayata in above cited locality. Japanese one belongs to *a. vulgaris* of Koch.

Drosera indica Linn. Sp. Pl. p. 282; Richt. Cod. n. 2232; Houtt. Nat. Hist. XXVI. (1777) p. 294, et Linn. Pfl.-Syst. VI. p. 271; Willd.

Sp. Pl. I. p. 1546; Pers. Syn. Pl. I. p. 337; Spreng. Syst. Veg. I. p. 955; Schult. Syst. Veg. VI. p. 767; DC. Prodr. I. p. 319; Roxb. Fl. Ind. II. p. 113; Wight et Arn. Prodr. Fl. Pen. Ind. Or. I. p. 34; Miq. Fl. Ind. Bat. I. 2, p. 120; Wight, Ill. tab. 20, f. C; Hook. fil. et Thoms. in Journ. Linn. Soc. II. p. 82; Planch. in Ann. Sc. Nat. Sér. 3, IX. (1849) p. 204; Hance in Journ. Bot. (1880) p. 261; Oliv. Fl. Trop. Afr. II. p. 402; Benth. Fl. Austral. II. p. 456; Clarke in Hook. fil. Brit. Ind. II. p. 424; Maxim. in Mém. Biol. XII. p. 459; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 289.

Drosera serpens Planch. l. c.

Annual, with short fibrous roots. Stem simple, usually erect, or decumbent, narrow, minutely pubescent, attaining 24 cm. in length. Leaves sparse, often spreading, or sometimes reflexed, angustato-linear, acuminate, attaining about 9 cm. long including the petiole, very piloso-pubescent with long delicate glandular hairs on the upper surface, pale green; petiole not long, glabrous, indistinct from the blade. Raceme leaf-opposite or produced between leaves on the opposite side of them, often longer than the leaves, spreading, laxly 2-9-flowered; rachis slender, minutely pubescent; bracts minute, filiform. Flowers pedicellate, about 9 mm. across, rosy (*f. rosea*) or white (*f. albiflora*); pedicels spreading, minutely pubescent, 4-13 mm. long. Calyx 5-parted; segments subulato-lanceolate, tapering, minutely pubescent. Petals 5, patent, longer than the calyx, spathulato-oblong. Stamens 5, about as long as the calyx. Ovary obovoid-oval; styles 3, parted into 2 long filiform branches, long-stigmatiferous above. Capsule oval-ellipsoid, hardly shorter than or equal to the persistent calyx, 1-celled, dehiscent into 3 1-placentiferous valves. Seeds black, obovoid; testa prominently sculariform-reticulated. Flowers July-October.

Nom. Jap. *Nagaba-ishimochisō*.

Hab. Prov. MIKAWA: Takashi-mura (*T. Makino!* Oct. 25, 1893, Aug. 1899, *f. rosea*), Takatori-mura in Aomi-gōri (*G. Nagura!* Oct. 12, 1899, *f. rosea*), Horikiri in Atsumi-gōri (*G. Nagura!* Aug. 2, 1901, *f. albiflora*); Prov. KADZUSA: Ichinomiya (Herb. ! Sc. Coll. Imp. Univ. Tokyo, Aug. 1880; *T. Makino!* Aug. 11, 1897, Aug. 10, 1901, July 5, 1902, *f. albiflora*); ISE: Yasudzuka-shinden in Kawage-gōri (*M. Kawasaki!* Sept. 14, 1903).

This is sparingly found in the provinces of Owari, Ise, Mikawa, Kadzusa, Hitachi, etc., in Middle Japan. There are two forms, one with white flower (*f. albiflora*), the other rosy flower (*f. rosea*); the latter form is slightly more robust.

Aldrovanda vesiculosa Linn. Sp. Pl. p. 281; Richt. Cod. n. 2226; Lam. Ill. tab. 220; Willd. Sp. Pl. I. p. 1543; Pers. Syn. Pl. I. p. 336; Spreng. Syst. Veg. I. p. 956; DC. Prodr. I. p. 319; Reichb. Fl. Germ. Excurs. p. 711; Roem. et Schult. Syst. Veg. VI. p. 759; Ledeb. Fl. Ross. I. p. 262; Nyman, Syl. Fl. Eur. p. 229; Casp. in Bot. Zeit. (1859) p. 117-123, 126-132, 133-139, 141-150, tab. 4-5, et (1862) p. 185-188, 201-206, tab. 7; Hook. fil. et Thoms. in Journ. Linn. Soc. II. p. 83; Wight et Arn. Prodr. Fl. Pen. Ind. Or. I. p. 34; Planch. in Ann. Sc. Nat. Sér. 3, IX. p. 304; Clarke in Hook. fil. Brit. Fl. Ind. II. p. 425; Korsh. in Act. Hort. Petrop. XII. p. 311; Makino, Phanerog. et Pterid. Jap. Ic. Ill. tab. 38.

Aldrovanda verticillata Roxb. Fl. Ind. II. p. 112.

Aldrovanda vesiculosa var. *verticillata* Darwin, Insect. Pl. p. 329; Makino, Notes on Jap. Pl. XIX. in Bot. Mag., Tokyo, VII. (1893) p. 285, tab. 11.

Aquatic perennial, floating, rootless, weak, diaphanous, green. Stem terete, with many nodes, simple or loosely few- (1-4) branched, foliate throughout, 6-26 cm. long. Leaves numerous, situated on nodes, patent, 6-8-verticillate; whorls approximate, $1\frac{1}{2}$ -2 cm. in diameter; the blade small, cochlear, conduplicate and vesiculose, semiorbicular, with a very minute spinose point (which is the projecting tip of the midrib) at the top, very shortly stipitate or sessile, minutely hairy towards the centre internally, narrowly folded and loosely ciliated on margin, $2\frac{1}{2}$ - $4\frac{1}{2}$ mm. long; petiole oblong-cuneate or linear-cuneate, longer than the blade, cellular, 1-nerved, 3-7 mm. long, 5-6-long-fimbriate (the hairs nearly as long as the petiole and minutely spinulose except the base) at the top, in those under the pedicel destitute of the blade but 6-8-fimbriate (the middle hair very short but others long) at the top. Flower normally expanded (for a few hours in day) in air, small, axillary, solitary, pedicellate, ebracteate, a few to a plant, 6 mm. across, greenish; pedicel erect when flowering and then soon curved downwards, longer than the flower and leaves, 6-18 mm. long. Calyx deeply 5-parted, green; segments patulous, ovato-oblong or oblong-lanceolate, obtuse, minutely subdenticulate, vein inconspicuous. Petals 5, erect-patent, longer than the calyx, obovato-oblong, rounded-obtuse, membranaceous, with a few delicate veins, marcescent, $3\frac{1}{2}$ -4 mm. long. Stamens 5, included; filaments linear-subulate, erect; anther broad, didymous, introrse, subconnivent. Ovary ovoid, shorter than the calyx, 1-locular, 5-placentiferous, thin-walled; styles 5, filiform, shorter than the ovary, patent, then soon strongly curved upwards and its irregularly many-parted terminal stigmas conniv-

ent together with anthers; ovules 10, 2 to a placenta and situated in its middle, obovato-oblong, more or less contracted below, with a very short funicle. Capsule globoso-ovoid, longer than the persistent calyx, with styles at the top, 1-locular, 5-thin-valved, 10-seeded, 4-5 mm. long. Seeds ellipsoid, with a process at the base, 1 mm. across; testa black, crustaceous, shining; embryo very minute and short; albumen copious. Flowers July-August.

Nom. Jap. *Muzina-mo* (T. Makino).

Hab. Prov. MUSASHI: Yōda in Koiwa-mura (T. Makino! May 11, 1890, Aug. 1893, Aug. 7, 1894, Aug. 1902; S. Ikeno! herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 1890); Prov. HITACHI: Nasaka-ura in Namekata-gōri (Y. Suzuki! July 15, 1902).

Rare. In ours, the flower is normally expanded and the petals are not calyptrately connivent. It was discovered by me in May 11, 1890, and July, 1891, in flower, in stagnant water of a small pond about rice-field in Yōda at Koiwa-mura on the river side of Yedo (a main division of R. Tone), about 7 miles east of Tokyo. Its occurrence in this country is very interesting for the investigation of Japanese Flora.

Platanthera (Bifoliæ) **Okuboi** Makino sp. nov.

A terrestrial orchid, 20-45 cm. high, glabrous. Tuber elongately angustato-fusiform, perpendicular; roots few, simple. Stem erect, stout, straight, sheathing with 2-3 vaginate cataphylls at the base. Leaves 5-8; the lower 2 larger and normal, equal or nearly so in size and in form, 10-20 cm. long, 3-5 cm. broad, approximate, erect-patent, elliptical to narrowly oblong, obtuse at the base, obtusely to narrowly attenuated and amplexicaul at the base, evaginate, membranaceous, 7-8-nerved on each side; transverse veinlets oblique and loose, with a few simple or 2-3-forked erect branches on the upper side; upper leaves laxly disposed, adpressed or erect-patent, lanceolate, attenuated above with an obtuse point; semiamplexicaul, evaginate, 2-6 cm. long, the lowest one sometimes attaining about 12 cm. long. Raceme erect, densely or rather densely many-flowered, 5-10 cm. long, 3-4 cm. wide; rachis straight; bracts erect-patent, foliaceous, lanceolate to ovato-lanceolate, acuminate with an obtuse point, equal to or slightly longer than ovaries, membranaceous, 3-several-nerved, with loosely anastomosing veinlets, attaining about $2\frac{1}{4}$ cm. long. Flower viridescent white? Sepals membranaceous; the upper one erect, ovate or subdeltoid-ovate, obtuse, sub-5-nerved, 6-8 mm. long, 4-6 mm. wide;

lateral ones patent-reflexed, slightly oblique in shape, ovato-lanceolate or oblong-lanceolate, obtuse, longer than the upper one, 3-5-nerved, 8-10½ mm. long. Petals erect, slightly lower than the upper sepal, thickish, subfalcately ovato-linear or oblong-linear, obtuse, 3-nerved, about 6-6½ mm. long. Labellum lanceolato-ligulate, obtuse, entire, carnosulate, sub-5-nerved, about 10 mm. long, 3-3½ mm. wide at the base; spur longer than the ovary, elongate, narrow, falcate towards the apex, about 2½-3 cm. long. Column short, broad, emarginato-bifid at the top; anther-cells remote, obovoid-oblong; rostellum broadly obtuse; column-auricles ellipsoid. Ovary angustate, arcuate, gradually attenuated above, about 1½ cm. long.

Nom. Jap. *Hachijō-tsuresagi* (nov.).

Hab. ISL. HACHIJŌ: Nishiyama (*Saburō Ōkubo!* herb. Sc. Coll. Imp. Univ. Tokyo, May 13, 1887).

This species is known only from Isl. Hachijō. It is allied to *Platanthera japonica* (Thunb.) Lindley, of which the tuber is horizontal, the lower larger leaves more than two, the upper sepal subovato-elliptical and much concave, the lateral sepals shorter and broader, and the base of the anther-cells more produced; the veinlets of leaves are also different. It differs also from *Platanthera chlorantha* Cust. in all the respects except the bifolious habit. The nearest allied species seems to me to be *Platanthera orbiculata* (Pursh) Lindl. of North America.

Platanthera (Bifoliæ) ***ussuriensis*** (Regel et Maack) Maxim. in *Mél. Biol.* XII. p. 551 (1886); *Kränzl. Orchid. Gen. et Sp.* I. p. 629; *Rolfe in Journ. Linn. Soc.* XXXVI. p. 57.

Habenaria ussuriensis Miyabe *Fl. Kuril. Isl.* n. 251.

Platanthera tipuloides var. γ . *ussuriensis* Regel et Maack, *Tent. Fl. Ussur.* n. 477, tab. 10, fig. 7-9 (pess.); *Franch. et Sav. Enum. Pl. Jap.* II. p. 32.

Platanthera herbiola var. *japonica* A. Finet. in *Bull. Soc. Bot. France*, XLVII. (1900) p. 281.

A terrestrial orchid, 20-52 cm. in height, glabrous. Tuber slender, root-like, horizontal or obliquely so; roots few, simple. Stem erect, slender, sheathing at the base. Leaves several, membranaceous; lower 2 larger, erect-patent, vaginate, remote or approximate one another, the lowest one largest, oblanceolate to obovato-oblong, gradually cuneato-attenuated below, obtuse at the apex, delicately several-nerved on each side, with oblique

transverse veinlets, 8–15 cm. long except the vagina, 18–43 mm. broad, the next one smaller, oblong-lanceolate to linear-lanceolate, gradually cuneato-attenuated below, attenuated above and with an obtuse or acute point, few-several-nerved on each side, 4–15 cm. long, 4–33 mm. broad; the rest ones bract-like, adpressed, evaginate, amplexicaul, angustato-subulato-lanceolate or subulato-linear, acuminate, the lower one attaining about $3\frac{1}{2}$ cm. or rarely more long. Raceme erect, rather loosely many-flowered, about 6–21 cm. long; rachis slender, glabrous; bracts erect-patent, exceeding the flowers or equal to ovaries in length, angustately subulato-lanceolate or subulato-linear or subulate, acuminate, embracing the ovary by its base, membranaceous, 3–sub-5-nerved, attaining about 2 cm. long. Flowers small, flavo-viridescent. Sepals thin, 3-nerved; the upper one erect, ovato-orbiculate to elliptical-oval, rounded at the apex, concave, $2-2\frac{1}{2}$ mm. long; lateral ones reflexed, oblong, somewhat oblique in form, slightly longer than the upper one, $2\frac{1}{2}-3\frac{1}{2}$ mm. long. Petals erect, connivent with the upper sepal, carnosulate, equal to or slightly shorter than the upper sepal, lato-linear sometimes spathulate and arcuate, rounded-obtuse, 2-nerved. Labellum carnosulate, $2\frac{1}{2}-4\frac{1}{2}$ mm. long, rounded-obtuse or truncate sometimes subcordato-truncate at the base, trifid below, the midlobe larger, ovato-oblong to narrowly oblong, or subtriangular-oblong, rounded-obtuse at the apex, entire; the basal lobes patent, shortly obliquely subtriangular-ovate, obtuse or acutish, much shorter than the midlobe; spur pendulous, filiform, shortly attenuated with an obtuse point at the apex, often hardly enlarged towards the apex, equal to or slightly shorter than the ovary in length, slightly arcuate, about 6–7 mm. long. Column short and broad, truncate or emarginato-truncate at the top; anther-cells not long, distant; rostellum semiorbiculato-deltoid. Ovary angustate, gradually attenuated towards the top, about 6–8 mm. long.

Nom. Jap. *Tombo-sō* (Sōmoku-Dzusetsu), *Ko-tombosō* (T. Makino).

Hab. Prov. SHIMOTSUKE: Nikkō (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 13, 19, 1885; *T. Makino!* Aug. 1884); Prov. KŌDZUKE: Mt. Haruna (*R. Yatabe* and *S. Ōkubo!* herb. *ibid.* July 17, 1886); Prov. ECHIGO: Mt. Shimidzu-tōge (*R. Yatabe* and *S. Ōkubo!* herb. *ibid.* July 19, 1886), Mt. Myōkō (*S. Matsuda!* herb. *ibid.* July 26, 1894); Prov. SAGAMI: Hakone (Herb. *ibid.* Aug. 26, 1880, Sept. 2, 1883; *T. Makino!* Sept. 25, 1886); Prov. ISE: Mt. Asama (Herb. *ibid.* Aug. 4, 1883), Watarayegōri (*Y. Uyematsu* and *K. Teraoka!* 1903); Prov. HITACHI: Mt. Tsukuba (*C. Owatari!* herb. *ibid.* Aug. 27, 1895); Prov. SHINANO: Mt. Yatsugatake (*Y. Yabe!* herb. *ibid.* Aug. 19, 1902); Prov. TOSA: Mt. Kurotaki (*T. Yoshinaga!* Sept. 1890).

Scirpus (Monostachyi) pseudo-fluitans Makino sp. nov.

Quite pale green. Roots caespitose, fibrous. Stems caespitose, simple, or loosely short-ramose above, decumbent, radicant, multinodulose, partly enclosing with sheaths of leaves, foliate throughout, slender, terete, smooth, attaining about 32 cm. in length, the internodes much shorter than leaves. Leaves alternate, but subfasciculate at the top of stems, sheathing at the base, angustato-linear, entire with smooth edges, but hardly scabrous towards the apex, acute or subobtuse, flat but often shallowly subcanaliculate below in front, flatly rounded dorsally, rather thickish, rather strongly 3-4-nerved, with very loose transverse distinct veinlets between nerves, attaining 16 cm. long including the sheathing portion, $\frac{3}{8}$ -2 mm. wide; sheath tubular and often at length breaking, with a subtruncate mouth, pale-membranaceous, attaining $2\frac{1}{3}$ cm. in length. Peduncles 1 or 2 (approximately placed) at the top of stems, slender, rather stout, compressed (oblong in section), with smooth edges, slightly contracted at the top, monostachyus, shorter or longer than leaf-like bracts, but, when there 2 present, its superior one enclosed by sheaths with a much reduced lamina, 5-14 cm. long, enclosed with the sheath of bracts at the base. Spikelet solitary, terminal, elliptical to oblong, obtuse or acutish-obtuse, 5-7 mm. long in flower, many-flowered (about 17-30 in number), glumes all fertile, without inferior empty glume. Glumes densely imbricated, ovate to oblong-ovate, obtuse, hyalino-membranaceous towards the quite entire margin, green towards the midrib, concave, subcarinate with a smooth edge, delicately and indistinctly 6-9-striate on each side of the midrib, 4-4 $\frac{1}{2}$ mm. long, 2-3 mm. broad, the outermost one erect, shorter or sometimes somewhat longer than spikelet, with a flower in its axil, subulato-oblong to oblong-linear, or linear, acute or subobtuse, entire, often leaf-like and thickish above, 3-4-nerved, with transverse veinlets between nerves, dilated and embracing the base of spikelet at the base, 4-9 mm. long. Rachilla notched, glabrous. Stamens 3; filaments filiform; anther linear, yellow, subbifid-truncate at the base, acute with a connective-tip at the apex, about 1 $\frac{1}{2}$ mm. long. Ovary sessile, oblong-elliptical, compressed, smooth, pale, about 1 mm. long; style much longer than the ovary, about 5 $\frac{1}{2}$ mm. long, rather stout, very deeply bifid, arms filiform, minutely puberulent, much longer than the smooth connate portion.

Nom. Jap. *Byakko-i*, *Uki-i* (nov.).

Hab. Prov. Iwashiro: Tonokuchi-hara (*G. Nakahara!* Aug. 1904); Prov. Shimotsuke: Ōtahara (*T. Watanabe!* Jan. 3, 1905).

Rare. This species is very closely allied to *Scirpus fluitans* Linn., from which it differs by its robustness and stiffness in every respect, quite

viridescens habit, broader and longer leaves, larger and numerous-flowered spikelets, and the more or less distinctly leaf-like lowest glume. Possibly a remarkable variety of *S. fluitans* Linn.

Taraxacum officinale Weber. var. *ε. lividum* Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 367; Herd. Pl. Radd. III. 4, pp. 39, 43; A. Gray, Syn. Fl. N. Amer. I. 2, p. 440.

Leontodon lividus Waldst. et Kitaib. 'Pl. Rar. Hung. II. p. 120, tab. 115'; Willd. Sp. Pl. III. p. 1545.

Taraxacum palustre DC. Fl. Fr. IV. p. 45, et Prodr. VII. p. 148.

Leontodon palustre Smith 'Fl. Brit. II. p. 823.'

Leontodon Taraxacum β. palustre Wimm. et Grab. 'Fl. Sil. II. p. 225.'

Taraxacum officinale var. *palustre* Syme, Engl. Bot. ed. 3, V. p. 143, tab. 804.

Leaves glabrous or subglabrous, obovato-oblong, gradually long-attenuated below, rounded-obtuse with a sharp tip at the apex, sharply and irregularly subruncinato-dentate or repand-subdentate. Flower yellow. Scape thinly tomentose under the head, exceeding the leaves, in fruit attaining about 5 decim. in height and glabrate. Involucre glabrous, nigrescent when dried; the external scales adpressed, ovate to ovato-lanceolate, acuminate with an obtuse point; interior scales angustate, ecorniculate below the apex. Achene obovato-linear, 5 mm. long, umber-isabel-coloured, squamoso-muricate towards the apex.

Nom. Jap. *Miyama-tampopo* (nov.).

Hab. Prov. SHINANO: Shirouma (*M. Orii!* Aug. 1902; *Y. Yabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 26, 1902; *K. Tanaka!* Aug. 1903; *A. Yasuda!* Aug. 1904).

This variety is new to the Flora of Japan.

Arundinaria Tootsik (Sieb.) Makino in Bot. Mag., Tokyo, XIV. (1900) p. 62 (Jap.); Id. in Descr. d. Prod. forest. d. Jap. exp. à l'Exposit. univ. d. 1900, p. 38; Matsum. Ind. Pl. Jap. II. 1, p. 90.

Bambos Tootsik Sieb. Syn. Pl. Oeconom. Jap. in Verh. Batav. Gen. XII. (1830) p. 5.

Rhizome creeping. Culm attaining 5 m. in height and $3\frac{1}{2}$ cm. in diameter, erect, terete, but semiterete and often flexuous above, fistulose,

glabrous, more or less finely striate, darkish green and often purplish; nodes bi-annular, conspicuously prominent, piloso-tomentose with purple hairs when young; internodes long, the longest one about 5 decim.; main branches erect-patent, 3 to a node of culm and then subfasciculate; branchlets fasciculate, sub-semiterete, prominent at nodes, with deciduous sheaths which are angustato-lanceolate in the upper ones and subulato-deltoid in the lower ones. Leaves dense, about 3-9 to a branchlet, approximate, lanceolate, or angustato-lanceolate, acuminate with a very sharp point at the apex, obtuse or acute at the base and decurrent to a distinct petiole (which is 3-10 mm. in length), 6-22 cm. long, 1-3½ cm. broad, scabro-ciliated on the margin, thinly chartaceous, green and glabrous above, pubescent and subglauous beneath; veins 4-8 on each side; venules very finely tessellate; ligule short, truncate; sheath glabrous, ciliated on the margin, striate; cilia of mouth long (the longest one 1½ cm.) and erect or radiate, deciduous. Culm-sheath ovato-lanceolate, green, purplish towards the margin, glabrous, but ciliated with patent purple pilose hairs, striate, subpatently dense-pilose with dark-purple hairs at the base, long-ciliated at the top; ligule erect, short, broad, truncate, minutely ciliated, puberulent dorsally; microphyll linear or linear-lanceolate, gradually acuminate, ciliato-scabrous with purple spinulose hairs on margin, chartaceous, green, slightly purplish towards the apex, closely many-nerved. Inflorescence paniculate, cernuo-pendulous, or ascending, loose or rather dense; peduncles loosely branched, narrow, prominent at nodes, glabrous; sheath subulato-lanceolate to subulato-linear, chartaceo-membranaceous, ciliated with spreading hairs, striate, 1½-4 cm. long, with a small deciduous subulate microphyll. Spikelets fasciculately or sub-racemosely disposed, pedicellate, slender, elongate, filiform, loosely and alternately flowered, 8-20 cm. long, 2-3 mm. across; rachilla slender, slightly flexuous, viridescent; internodes compressed, lato-linear, puberulent above, 5-7 mm. long; pedicel 3-30 mm. long, gracile, straight, covered with scaly sheaths, few- to several-jointed, puberulent; sheaths membranaceous, striate, the lower ones shorter and imbricate, subulato-ovate, mucronate or cuspidate, ciliated or subciliated, several- to subnumerous-nerved, the superior ones gradually longer, the uppermost one oblong-linear, with a minute subulate microphyll or sometimes a normal blade, ciliated on one margin, many-nerved, about 16 mm. long. Flowers erect and adpressed to the rachilla, longer than the internodes, oblong-linear, sharply tapering at the apex, green, glabrous, 7-12 mm. long. Empty glumes 2 or sometimes 3, approximate, sub-closely placed to the lowest flower, viridescent, acute and with an apiculate scabrous tip, minutely

ciliated at the apical margin, many-nerved, with very loose transverse veinlets between nerves, chartaceous or membranaceo-chartaceous, minutely pubescent above internally; the lower one slightly smaller and ovate to oblong-ovate, $6\frac{1}{2}$ -9 mm. long; the superior one ovate to elliptical-ovate, 8-10 mm. long; the lowest one (when 3) smaller and elliptical-ovate. Flowering glume enclosing the rachilla in front, subcoriaceous-chartaceous, glabrous, but minutely ciliated towards the apex and puberulent at the apical tip, thin and subscarious towards the margin, ovate, acute and with cuspidate tip, rounded dorsally, about 5-7 on each side of the midrib, transverse venules loose. Palea slightly shorter than the flowering glume, about 7-10 mm. long, bicarinate, chartaceous-membranaceous, viridescent, oblong, obtuse or subbifid with incurved lobes and pilose at the apex, ciliated with erect-patent and spinulose hairs in carinae above, glabrous on margin but often subciliated towards the apex, 2- or sub-3-nerved on the outside of the carina, delicately and loosely reticulato-nerved between carinae above. Lodicules 3, erect, membranaceous, nervate, ciliated above, subrhomboid-elliptical-ovate, obtuse, the posterior ones slightly oblique in size and subcuneate and thickish below, about $2\frac{1}{2}$ mm. long. Stamens 3, exserted; filament filiform, glabrous, longer than the anther; anther lato-linear or oblong-linear, 4-5 mm. long, light yellow, shortly bifid at the apex, bi-auriculated at the base. Ovary oblong-cylindrical, glabrous, about $1\frac{3}{8}$ -2 mm. long; style longer than the ovary, 7-8 mm. long including the ovary, deeply 3-fid, arms filiform, villosoplumose, longer than the connate portion, which is enlarged towards the base. Caryopsis.....

Nom. Jap. *Tō-chiku*.

Hab. Prov. TOSA: Sakawa, cult. (*T. Makino!* Nov. 1892, 1894), Kōchi, cult. (*T. Makino!* Dec. 1892); Prov. TŌTŌMI: Washidzu, cult. (*T. Makino!* Oct. 1894); Prov. YAMASHIRO: Mukōmachi, cult. (*T. Makino!* Nov. 6, 1894); Prov. MINO: Kusafuka, cult. (*T. Makino!* Aug. 1899); Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*Herb.!* Sc. Coll. Imp. Univ. Tokyo; *T. Makino!* Nov. 17, 1894); Prov. IYO: Matzuyama, cult. (*K. Okudaira!* no. 96, Sept. 1901, June 1903).

This bamboo is found in the middle and southern Japan, cultivated in gardens as an ornament or sometimes as a hedge plant. It is nowhere found wild in this country. It was introduced from China in olden time, hence the name *Tō-chiku* (*Tōo-tsik*), i. e., a Chinese bamboo. The peculiarity on this bamboo is its elongated internodes, which are, however, without special value. The shoot is unedible. The flower is rarely met with, and for the floriferous specimens I owe to the kindness of Mr. Kan-ichi Okudaira.

Asparagus (*Euasparagus*) **oligoclonus** Maxim. Prim. Fl. Amur. (1859) p. 287; Miq. Prol. Fl. Jap. p. 315; Franch. et Sav. Enum. Pl. Jap. II. p. 59; Baker, Rev. Gen. et Sp. Asparag. in Journ. Linn. Soc. XIV. (1875) p. 599; Bretsch. Hist. Bot. Bisc. in China, p. 615; Palib. Consp. Fl. Kor. III. p. 9; Matsum. Ind. Pl. Jap. II. 1, p. 192.

Asparagus officinalis var. Sieb. herb. ex Miq. l. c.

Asparagus Tamaboki Yatabe in Bot. Mag., Tokyo, VII. (1893) p. 61, tab. 4; Matsum. l. c.

Perennial. Rhizome short, creeping or ascending, ramose, hard; roots dense, elongate, slender, strong. Stem erect or ascending, attaining about 70 cm. in height, subterete and loosely sparse with adpressed scaly leaves in the basal portion, subangulato-terete (but sulcato-angulate when dried) and substrate above, smooth in angles when recent but subscabrous above when dried as are branches, deep green and disparsed with very minute pale spots under lens as are the branches; branches numerous and subclose, disposed into a pyramidal form, erect-patent or patulose, straight, subangulate and striate, slightly compressed towards the base, with dense cladodia excepting the base, the lower ones longer and attaining about 29 cm. in length, the superior ones gradually shorter and the uppermost one about $1\frac{1}{3}$ cm. long, the inferior ones often with about 1-5 (or sometimes 14) patulose branchlets which are attaining about 6 cm. long; internodes much shorter than the fascicles of cladodia. Leaves deltoid, subulato-deltoid in those of the upper portion of stem, sharply acuminate, closely adpressed, membranaceous, very shortly produced at the base, 2-8 mm. long, 2-7 mm. broad; those under cladodia small, deltoid, shortly acute, thinly membranaceous, scarious, often subtrilobed, the basal projection obscure. Cladodia 1-8, fasciculate, spreading or erect-patent, nearly equal in length, linear-filiform, subulate above with a sharply acute point, angulato-subterete, striate when dried, straight but somewhat arcuate, about $2-3\frac{2}{3}$ cm. long or shorter, $\frac{2}{3}-\frac{1}{2}$ mm. sometimes 1 mm. across, deep green, densely scattered with very minute pale spots under lens. Flowers appear below the middle of stem and branches, numerous and dense, diœcious, pedicellate, geminate; pedicel gracile, 7-9 mm. or more long in flower, articulated in middle or above it, the lower half subhorizontal, the upper half thicker and deflexed. Male flower: perianth turned downwards, 6-7 mm. long, 6 mm. across in the limb, tubuloso-campanulate with patent-recurved limb, obtuse at the base, glabrous, yellowish-viridescent and usually shaded with dark purple (the shade often deeper towards the tube); the tube very slightly shorter than the limb; segments obtuse, thinner and slightly pale towards the entire

margin; the outer ones very slightly shorter, ovato-oblong and subattenuated below; the inner ones ovato-elliptical and subattenuated below; nerve 1, strong, disappears before reaching the apex. Stamens included, erect, equal in height, $\frac{2}{3}$ of perianth in length; filament $\frac{2}{3}$ - $\frac{1}{2}$ -adnate to the perianth-tube, subulate, glabrous, greenish; anther subovately linear-oblong; longer than the free portion of filament, cordato-bilobed at the base, minutely deltoid-apiculate at the apex, 2 mm. long, pale orange, with orange-coloured pollen. Ovary (of male flower) rudimentary, globoso-ellipsoid, sessile, about $\frac{1}{3}$ as long as the stamens, green, glabrous, obtusely 3-subangulate and 3-sulcate, 3-celled, each cell containing very minute rudimentary ovules, 1 mm. and a little more long; style very short being merely a minute projection, closely sub-3-lobed. Female flower..... Berry globose, 8-10 mm. across, red, smooth; seed somewhat compressed, subellipsoid-globose, black, about $4\frac{1}{2}$ mm. long; pedicel 8-16 mm. long.

Nom. Jap. *Tamabōki*.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (*T. Makino*! July 2, 1898, May, 1899, male); Prov. HIGO: Mt. Aso, spont. (*Y. Yabe*! herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 28, 1901, female, fructiferous).

Asparagus Tamaboki Yatabe is evidently a male plant of *A. oligoclonos* Maxim. having the rudimentary ovary, which is incorrectly described as the normal one by the author. The section to which this plant belongs is not *Asparagopsis* (Kunth), but *Euasparagus*. The proper flowering time of this species is not October as reported by the same author, but May. This species comes near to *A. officinalis* Linn., and the flower has the close resemblance one another.

Rumex maritimus Linn. Cod. n. 2585.

Nom. Jap. *Kogane-gishigishi*, *Hama-gishigishi* (T. Makino).

Hab. Prov. MUTSU: Shirokane near Hachinohe in Sannohe-gōri (*T. Miwa*! no. 4, Aug. 19, 1904).

New to the Flora of Japan. Rare.

Sedum senanense Makino in Bot. Mag., Tokyo, XVI. (1902) p. 213. =

Sedum japonicum Sieb. var. **senanense** Makino.

Sedum yedoense Makino ms.

Cyme terminal, 1-3 $\frac{1}{2}$ cm. across, few-many-flowered; branches flexuous, attaining about 17 mm. in length, 1-7-flowered. Flowers sessile, but the

central one very shortly pedicellate, 6–10 mm. across. Sepals erect-patent, lanceolato-oblong or linear-lanceolate, yellowish viridescent. Petals horizontally petent, twice as long as sepals, subrhomboidly ovato-lanceolate, 4–5 mm. long, $1\frac{2}{3}$ mm. wide. Stamens: the oppositipetalous ones scarcely shorter than the opositisepalous ones; filament yellow. Ovaries erect or erect-patent, slightly compressed laterally, yellow, about 4 mm. long including the style; style erect, gracile, nearly $\frac{1}{2}$ as long as the ovary. Flowers May (in Tokyo).

Nom. Jap. *Miyama-mannengusa*, *Benitsudzuki*.

Nasturtium amphibium (Linn.) R. Br. in Ait. Hort. Kew. ed. 2, IV. p. 110; Matsum. in Bot. Mag., Tokyo, XIII. (1899) p. 60.

Sisymbrium amphibium Linn. Cod. n. 4781.

Nom. Jap. *Migiwa-garashi* (nom. nov.).

Hab. Prov. SHIMOTSUKE: Side of Lake Yunoumi in Nikkō (*T. Makino!* July 1884, Aug. 1903), Tadenoumi in Nikkō (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tōkyō, July 23, 1885); Prov. ISHIKARI: Sapporo (*J. Matsumura!* herb. ibid. July 30, 1899).

Sisymbrium (Velaroides) **Maximowiczii** Palib. Consp. Fl. Kor. I. in Act. Hort. Petrop. XVII. p. 28, tab. 2 (1899); Matsum. in Bot. Mag., Tokyo, XVI. (1902) p. 17; Yabe in Bot. Mag., Tokyo, XVII. (1903) p. 197.

Alyssi species dubia fr. deficiente Miq. in Ann. Mus. Bot. Lugd.-Bata. III. p. 200, et Prol. Fl. Jap. p. 364.

Arabis sp. n.? Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 43.

Berteroa incana Franch. "in Mém. Soc. Cherbourg, XXIV. (1884) p. 199"?

Petals lilaceous!

Nom. Jap. *Hana-nadzuna* (nom. nov.).

Hab. Prov. TSUSHIMA: Kurochō-zaka between Mine and Kubara (*Y. Yabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 28, 1901), Kōzaki (*Y. Yabe!* herb. ibid. Aug. 20, 1901; *K. Hirata!* Aug. 18, 1903); Prov. AKI: Mt. Ege in Sayeki-gōri (*S. Kuriyama!* n. 157, Aug. 1904).

Rare in Japan.

Elodes virginica Nutt. var. **japonica** (Bl.) Makino.

Elodea japonica Bl. Mus. Bot. Lugd.-Batav. II. p. 15 (1852).

Elodea crassifolia Bl. l. c.

Hypericum virginicum Miq. Prol. Fl. Jap. p. 146; Franch. et Sav. Enum. Pl. Jap. I. p. 56, non Linn.

Elodea virginica Regel, Tent. Fl. Ussur. n. 104?

Hypericum petiolatum Miq. l. c., non Walt., nec Franch. et Sav. I. p. 56.

Elodes virginica var. *asiatica* Maxim. in Mém. Biol. XI. p. 157 (1881).

Nom. Jap. *Midzu-otogiri*, *Midzu-yanagi*.

Hab. Japan, sparingly distributed.

STIGMATODACTYLUS Maxim. in litt. 1890.—*Diuridea*, NEOTTIEÆ, ORCHIDACEÆ.

Perianth free, patent. Sepals subequal, the lateral ones subfalcate. Petals similar to the lateral sepals. Labellum sessile to the very base of the erect column, undivided, flat, membranaceous, the face naked, but the base with a subcarnose 2-parted appendage partly connected to the base of column. Column erect, rather long, incurved above, semiterete, narrowly 2-alate above, with a process in the middle in front; clinandrium concave, continued to the alæ of column. Anther 2-celled, cells contiguous, valves strongly adnate to the connective. Pollinia 4, in 2 pairs, sessile, compressed. Stigma under the short rostellum, broad, concave, furnished with a capitate-tipped long appendage on the lower edge. Capsule erect-patent, narrowly oblong.

Small terrestrial herb, 1-foliate, racemosely 1-3-flowered; rhizome elongate, with a small tuber at the end. Stem simple, erect, glabrous. Leaf in the middle of stem, sessile, evaginate, ovate, acuminate. Flower erect, not reverse, very shortly pedicellate; bracts foliaceous.

Stigmatodactylus sikokianus Maxim. in litt. 1890; Makino, Ill. Fl. Jap. I. n. 7 (1891) tab. 43; in Bot. Mag., Tokyo, XIII. (1899) p. 9; et Phanerog. et Pterid. Jap. Icon. Illustr. I. tab. 39 (1900); Matsum. Ind. Pl. Jap. II. 1, p. 263.

A perennial Orchid, about 3-10 cm. high, glabrous. Rhizome hypogæous, often curved, somewhat thicker above, pale, flaccid, covered with root-hairs, provided with a few (about 2) minute colourless scales above, at each axil of scales with a short pale and slightly fleshy branch; the tuber small, simple, globose to ellipsoid, attaining about 3 mm. across. Stem slender, angulate, pale green, furnished with the single leaf above the middle

and a minute scale at the base. Leaves small, semi-amplexicaul, ovate, acuminate, entire and more or less crispate on margin, green, the midrib inconspicuous, the lateral vein 1 on each side and arcuate; those of sterile stem few, petiolate, vaginate at the base, orbicular, acute. Raceme short, terminal, loosely flowered; rachis flexuous, angulate; bracts patent, sessile and semi-amplexicaul, similar to leaves in form but slightly smaller. Flower large in proportion. Perianth subequal, linear, acuminate, entire, membranaceous, 1-nerved, somewhat incurved. Sepals bearded with long and few hairs on both basal margins, more or less narrowly inflexed on margin, light green, but the superior one also shaded with purple in the lower half; the superior one 4 mm. long; lateral ones shorter and $2\frac{1}{2}$ mm. long, hidden under the labellum when flower expanded. Petals not bearded on the basal margins, light green and shaded with purple below, $3\frac{1}{2}$ mm. long. Labellum ample, patent, orbiculate, scarcely short-attenuated below, entire but minutely crenulated on the front margin, 4 mm. across, very light purple, but deep purple vertically in centre; appendage directed to the front, much shorter than the labellum and $1\frac{1}{2}$ mm. in length, cut down to the midway into two lobes of the upper and lower, purple; lobes shortly bifid at the apex, the upper one a little shorter. Column light green, $3\frac{1}{2}$ mm. long; appendage minute and emarginate; clinandrium with an obtuse short rostellum in the front sinus; anther-valves minutely tuberculate on the surface, light brown. Pollinia minute, elliptical, light purple-brown. Ovary linear-oblong, more or less attenuated below into a short and not contorted pedicel, triangular, with an elevated ridge on each surface, about 5 mm. long, light green, 1-locular, 3-placentiferous; ovules minute, numerous, white. Capsule (immature) shortly pedicellate, linear-oblong, triangular, with an elevated ridge on each surface, crowned with persistent perianth and column. Flowers August-September.

Nom. Jap. *Kōrogi-ran* (T. Makino).

Hab. Prov. TOSA: Mt. Yokogura (*T. Makino!* Sept. 4, 1889).

A very rare Orchid, growing among decayed leaves in shady places on mountains. It was discovered by me in the above-cited date and locality. C. J. Maximowicz says:—"The Orchid is quite a new genus of the tribe *Neottieae*, subtribe *Diurideae*, and allied to the Tasmanian *Burnettia* and the Australian *Glossodia*. Your analysis is excellent. I dissected a flower bud myself and found everything just as figured by you. I have called the plant, on account of the remarkable fingerlike appendage under stigma, *Stigmatodactylus Sikokianus*."

Gymnadenia Mitostigma (Blume) Makino.

Mitostigma gracilis Blume, Mus. Bot. Lugd.-Batav. II. p. 190 (1856).

Gymnadenia gracilis Miq. Prol. Fl. Jap. p. 139; Franch. et Sav. Enum. Pl. Jap. II. p. 30; Maxim. in Bull. Soc. Nat. Mosc. (1879) p. 60, ex parte; Makino in Bot. Mag., Tokyo, III. (1889) p. 7; Finet in Bull. Soc. Bot. France (1900) p. 280; Palib. Consp. Fl. Kor. III. p. 3; Rolfe in Journ. Linn. Soc. XXXVI. p. 53; Matsum. Ind. Pl. Jap. II. 1, p. 249.

Cynosorchis gracilis Kränzl. Orchid. Gen. et Sp. I. p. 488.

Gymnadenia tryphiciformis Reichb. fil. in Linnæa, XLI. (1877) p. 41; Diels in Engl. Bot. Jahrb. XXIX. p. 265.

Gymnadenia pinguicula Bretschn. Hist. Eur. Bot. Disc. Chin. p. 688, non Reichb. fil. et S. Moore.

Nom. Jap. *Hina-ran*, *Hime-iwaran*, *Kumo-ran*.

Hab. Prov. TOSA: Takeyashiki in Nanokawa (*K. Watanabe!* June 7, 1888), Mt. Yokogura (*T. Makino!* May 1893), Karatani (*T. Makino!*), Tochū in Hongawa (*T. Yoshinaga!* Aug. 1890); Prov. IYO: Mt. Kwanon-dake in Kashiwa-mura (*Z. Umemura!* no. 14, Sept. 2, 1896); Prov. SETSU: Mt. Maya? (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, May 1879); Prov. SUŌ: Ichinosaka in Kamiunoryō-mura (*D. Nikai!* herb. *ibid.* July 2, 1893).

Cymbidium Hoosui Makino in Bot. Mag., Tokyo, XVI. (1902) p. 27. =

Cymbidium sinense Willd. Sp. Pl. IV. (1805) p. 111; Pers. Syn. Pl. II. (1807) p. 517; Spreng. Syst. Veg. III. (1826) p. 723 (*chinense*); Ait. Hort. Kew. ed. 2, V. p. 214; Lindl. Gen. et Sp. Orchid. Pl. p. 162; et in Journ. Linn. Soc. Bot. III. (1859) p. 30; Rolfe in Journ. Linn. Soc. XXXVI. p. 31.

Epidendrum sinense Andr. 'Bot. Rep. III. tab. 216'; Bot. Mag. tab. 888

Cymbidium fragrans Salisb. 'in Trans. Hort. Soc. I. (1812) p. 298.'

Cymbidium ensifolium Hook. fil. Fl. Brit. Ind. VI. p. 13, pro parte.

Nom. Jap. *Hōsai-ran*.

Distrib. British India and China.

Viola (Nomimium) **blanda** Willd. Hort. Berol. t. 24; Pursh, Fl. Am. Sept. I. p. 172; Nutt. Gen. N. Am. Pl. I. p. 149; Spreng. Syst. Veg. I. p. 798; Hook. Fl. Bor. Am. I. p. 76; DC. Prodr. I. p. 295; Ledeb. Fl. Ross. I. p. 247; Roem. et Schult. Syst. Veg. V. p. 358; Torr. et Gray, Fl. N.

Am. I. p. 138; Regel, Pl. Radd. I. p. 234, tab. 6, fig. 20-23; A. Gray, Man. Bot. ed. 5, p. 77, et Syn. Fl. N. Am. I. 1, p. 198; Wood, Cl.-Book Bot. p. 242; Maxim. in Mél. Biol. IX. p. 732.

Viola brachyceras Turcz. in Bull. Soc. Nat. Mosc. XV. (1842) p. 301; Ledeb. l. c. p. 246.

Viola pallens Forster ex Rœm. et Schult. l. c. p. 359.

Perennial, acaulescent. Rhizome subterranean, slender, creeping, ascending above, gracile and rarely branched in the lower portion, loosely with delicate ramose roots throughout, about 2-6 cm. long, hard, approximately with notched numerous nodes having old rusty-brown stipules and the base of petioles. Leaves 1 to 4, long-petiolate, reniform, suborbiculato-reniform, or ovato-reniform, deeply cordate with a close or open sinus at the base, truncate or truncato-obtuse or shortly produced or angulato-obtuse with a callose end at the apex, depressed-crenate with papillato-subcallose point, membranaceous, very thinly pubescent or glabrate above, glabrous beneath, loosely ciliated or glabrous on margin, 16-22 mm. long, 18-24 mm. broad in flower, but afterwards attaining nearly 45 mm. long, 54 mm. broad; nerves delicate, 7-9-radiato-palmate, with loose veinlets; petiole slender, gracile, wingless, glabrous, about 3-6 cm. long in flower, but then attaining about 9 cm. long; stipules erect, subulato-deltoid, usually produced-acuminate, shortly adherent to the petiole, membranaceous, loosely papilloso-ciliated on margin, brown, glabrous, about 2 mm. long. Peduncles 1-3, erect, usually exceeding the leaves, slender, gracile, glabrous, about 2-9½ cm. long, bracteolate above the middle; bracteoles 2, opposite or approximate, linear-subulate, acuminate, glabrous, papillose on the basal margin, 2-2½ mm. long. Flower small, about 8 mm. across, white. Sepals oblong- to ovato-lanceolate, acutish-obtuse at the apex, narrowly hyaline and sometimes minutely loose-ciliated on margin, glabrous, delicately 3-nerved, about 3½ mm. long excepting the basal auricles, lateral ones somewhat shorter; basal auricles depressed-semiorbicular, rounded at the apex, entire, ½-⅔ mm. long. Upper and lateral petals obovato-oblong, attenuated below, rounded-obtuse at the apex, beardless, about 8 mm. long, 3 mm. or a little more wide; the lower petal slightly shorter and broader, obovate, emarginate at the apex, marked with dark purple veins as are the lateral petals; calcar short and small, shorter than sepals, ovato-semiorbicular, 1 mm. and a little more long, 1½ mm. broad. Stamens 2 mm. and a little more long; connective-tip oblong-ovate, obtuse, hardly shorter than the anther-cell; appendages minute, short, subdeltoid-semiorbicular, rounded-obtuse, thicker towards the margin, ½ mm. long. Ovary ovoid, tapering above, glabrous, 1 mm. and a little more long; style

longer than the ovary, exserted from the anther, geniculate at the base, stout-filiform, about 2 mm. long; stigma subcapitate, depressed-concave, semiorbicularly marginate excepting the lower side, provided with a minute short straight and erect rostrum. Capsule ellipsoid, acute or obtuse, glabrous, purple-maculate, 6 mm. long; seed shortly ellipsoid. Flowers June.

Nom. Jap. *Usuba-sumire* (T. Makino).

Hab. Prov. SHIMOTSUKE: Mt. Nyohō in Nikkō (*T. Makino!* Aug. 1901, July 1904); Prov. SHINANO: Mt. Komagatake (*K. Tanaka!* Sept. 25, 1902); Prov. RIKUZEN: Mt. Goyō in Kesen-gōri (*G. Toba!* no. 18, June 13, 1904); Prov. RIKUCHŪ: Mt. Hayachine (*G. Yamada!* no. 60, Aug. 5, 1904).

New to the Flora of Japan. It is found on alpine mountains in the middle and northern Japan.

Viola Yatabei Makino in Bot. Magaz., Tokyo, XVI. (1902) p. 122. = **Viola** (Nomimium) **yezoensis** Maxim. in Mél. Biol. IX. p. 736 (1876); Boissieu in Bull. Soc. Bot. France (1900) p. 322.

Viola phalacrocarpa var. *pallida* Yatabe in Bot. Mag., Tokyo, VI. (1892) p. 102, ex parte.

Viola flaccida Makino in Bot. Mag., Tokyo, XIII. (1899) p. 242, nomen tantum.

Nom. Jap. *Hikage-sumire*, *Ezo-kosumire*, *Shin-sumire*.

Add. Hab. Prov. KŌDZUKE: Yoshii in Tano-gōri (*T. Arai!* May 8, 1903); Prov. SHIMOTZUKE: Foot of Mt. Nakimushi in Nikkō (*M. Furukawa!* Aug. 23, 1903); Prov. IWASHIRO: Obama-mura in Adachi-gōri (*G. Nakahara!* May 1904); Prov. SHIMOOSA: Chiba (*I. Yamatsuta!* June 1905).

Viola Savatieri Makino in Bot. Mag., Tokyo, XVI. (1902) p. 125. = **Viola** (Nomimium) **Patrini** DC. var. **acuminata** (Franch. et Sav.) Makino.

Viola incisa var. *acuminata* Franch. et Sav. Enum. Pl. Jap. I. p. 41, et II. p. 248; Maxim. in Mél. Biol. IX. p. 720.

Nom. Jap. *Yedo-sumire* (oldest name).

Viola kiusiana Makino in Bot. Mag., Tokyo, XVI. (1902) p. 138. = **Viola** (Nomimium) **diffusa** Gingins in DC. Prodr. I. (1824) p. 298; Spreng. Syst. Veg. I. (1825) p. 799; Hook. fil. et Thoms. in Hook. fil. Fl. Brit. Ind. I. p. 183 (1872); Benth. Fl. Hongk. p. 20; Maxim. in Mél.

Biol. IX. p. 735, et Pl. Chin. in Act. Hort. Petrop. XI. p. 61; Franch. Pl. David. I. p. 43; Forbes et Hemsl. in Journ. Linn. Soc. XXIII. p. 52; Henry, List Pl. Formos. p. 18; Diels, Fl. Cent.-Chin. in Engler's Bot. Jahrb. XXIX. p. 477.

Viola tenuis Benth. in 'Hook. Lond. Journ. Bot. I. (1842) p. 482.'

Perennial, caulescent, estoloniferous, pallid-green. Rhizome not long, erect or ascending, rooting; roots slender, with delicate slender rootlets, white. Main stem erect, short or inconspicuous; branches floriferous and foliiferous, loosely tufted, simple, ascending or decumbent, axillary to radical leaves, few to several, terete, glabrous or sparsely pilose with white patent hairs along one side, viridescent and sometimes with a purple shade, attaining about 8 cm. long in flower, but afterwards much decumbent and diffuse, stolon-like, attaining about 20 cm. in length, slender, loosely with alternate leaves below and also with a tuft of leaves and short-pedicellate cleistogamous flowers at the apex, whence rooting in autumn as to form an independent stock. Leaves petiolate, ciliated and sparsely pilose with white hairs above, nearly glabrous beneath, membranaceous, wholly green; radical ones tufted, elliptical to ovato-elliptical, obtuse at the apex, rounded and decurrent to the petiole at the base, regularly crenate, attaining about 3 cm. long, 2 cm. broad in flower, but afterwards attaining about $7\frac{1}{2}$ cm. long, $4\frac{1}{4}$ cm. broad, the midrib prominent beneath as are delicate and erect-patent veins 3-6 on each side and pinnately disposed; cauline ones smaller, loosely alternate below, but closely placed towards the apex; petiole shorter or longer than the blade, conspicuously winged, ciliated with white patent pilose hairs, after flower attaining $8\frac{1}{2}$ cm. in length; stipules adnate in basal portion, thinly membranaceous, pale-viridescent, subulato-lanceolate, acuminate, ciliato-fimbriate, 6-12 mm. long. Peduncles radical and in the axils of cauline leaves, arising above the leaves, erect or ascending, gracile, sparsely pilose with patent hairs below, glabrous above, bracteolate in the middle or above it but in cauline ones often below it, light green, about 3-7 cm. long in flower; bracteoles 2, opposite or somewhat remotely placed, linear or subulato-linear, acuminate, herbaceous, thinly ciliated on margins, pauci-glandular-dentate on the basal margins, 3-7 mm. long. Flowers small, 10-12 mm. across, light violaceous. Sepals ovato-lanceolate or lanceolate, acuminate-acute, membranaceous, glabrous or very thinly pilose, thinly ciliated on margins, 3-nerved, without veinlet, viridescent, 5-6 mm. long; basal auricles short, subtruncato-semiorbicular, sometimes crenulate in the superior one, slightly ciliated. Petals beardless, the upper one obovate and lateral ones oblong-obovate, rounded at the apex, much

attenuated below, a little oblique in form and 7–8 mm. long, light violaceous, but white below with a very dilute greenish colour; the lower one much shorter and smaller, concave, oblong-elliptical, rounded-obtuse at the apex, white, but violaceous above, with deep violet striæ; calcar very short, semi-orbicular, scrotiform, not exceeding beyond the basal auricles of the sepals, $1\frac{1}{3}$ –2 mm wide. Connective-tip ovato-orbicular, rounded-obtuse, slightly shorter than the anther-cells; appendages adnate to the anther, subrectangular-subdeltoid, acutish-obtuse-tipped, with a thick nearly straight front edge. Ovary oval, rounded-obtuse, glabrous; style as long as the ovary, enlarged above, geniculated at the base; stigma subbilobato-orbicular, slightly concave, with a very short rostrum. Capsule ellipsoid, obtuse, viridescent, glabrous, 5–6 mm. long; valves oblong. Seeds minute, lato-obovoid, acute at the base, 1 mm. long, sooty. Flowers March–April.

Nom. Jap. *Tsukushi-sumire* (T. Makino).

Hab. Prov. SATSUMA: Kagoshima (*Keisuke Tamura*! March 11, 1900; *Setsusaburō Tanaka*! March 30, 1903, April 27, 1903, May 6, 1903; *I. Nagashima*! March 1904, May 15, 1905).

Distrib. Formosa, China, and British India.

***Anemone debilis* Fisch. var. *soyensis* (de Bois.) Makino.**

Anemone soyensis de Bois. in Bull. Herb. Boiss. VII. (1899) p. 590.

Perennial, about 10–14 cm. high. Rhizome gracile, repent, loosely rooting. Radical leaves with a long and glabrous petiole, simply ternate, thinly pubescent above, glabrous beneath, ciliated on margin, membranaceous, flaccid, $1\frac{1}{2}$ –3 cm. long, 2– $3\frac{1}{2}$ cm. wide; leaflets shortly petiolulate, ample, obtuse, broadly truncato-cuneate at the base, obtuso- or acuto-dentate with a very minute mucronate point; lateral ones subrhombico-rounded, oblique in form, in size nearly equal to the terminal one which is rounded often trifid and 10–19 mm. in length. Stem erect, gracile, glabrescent, with a few membranaceous ovate or oval vaginæ at the base, 7–10 cm. long. Involucral leaves 3, petiolate, ternate with sessile leaflets, cordato-deltoid in outline, thinly pubescent above, glabrous beneath, ciliated on margin, acute or obtuse with a very minute mucronate tip at the apex, inciso- or subinciso-serrato-dentate with mucronato-tipped obtuse or acute teeth, flaccid, membranaceous, 16–28 mm. long, 16–35 mm. broad; lateral ones smaller, oblong or elliptical-oblong, oblique in form, subbifid, the inner margin entire except the apical portion; the terminal one oblong-elliptical, cuneate below with entire margins, veins rather conspicuous and often pur-

purpurascens when recent beneath, loosely reticulated; petiole erect-patent, slightly shorter than the blade, ciliated on front margins (which are often purpurascens when recent), straight, 8–11 mm. long. Pedicel erect, longer than the involucre leaves, gracile, filiform, pubescent with ascending-adpressed pale hairs throughout (hairs denser under the flower), 3–4 cm. long. Flower 16–18 mm. across, white. Sepals 5, patent, oblong to ovato-oblong, obtuse, membranaceous, glabrous on both surfaces, delicately veined, deciduous, 9–10 mm. long, 5–6 mm. broad. Stamens numerous, shorter than sepals; filament filiform; anther oblong, yellowish. Carpels several, sessile, pubescent with silvery erect-patent hairs, elliptical, tapering above into a short and often slightly curved glabrous style.

Nom. Jap. *Hiroba-himeichige* (T. Makino).

Hab. Prov. KITAMI: Sōya (*U. Faurie!* n. 9647, May 19, 1893); Prov. ISHIKARI: Asahigawa (*Shin-ya Itō!* comm. *Sei Igarashi* n. 7, May 1905).

This differs from the type by the broader leaves and larger flowers.

***Viola chærophyloides* (Regel) Makino var. *Sieboldiana* (Maxim.) Makino.**

Viola pinnata var. *Sieboldiana* Maxim. in Mém. Biol. IX. p. 718; Franch. et Sav. Enum. Pl. Jap. II. p. 646.

Viola Sieboldiana Makino in Bot. Mag., Tokyo, XIX. p. 144 (Jap.).

Nom. Jap. *Higo-sumire*.

Hab. Southern and Middle Japan, mountains.

***Viola* (Dischidium) *crassa* Makino.**

Viola biflora var. *crassifolia* Makino in Bot. Mag., Tokyo, XVI. (1902) p. 139.

Leaves sometimes much reniform, truncate or emarginato-truncate at the apex, attaining $5\frac{1}{2}$ cm. in width, 3 cm. in length. Seed obovoid-ellipsoid, sooty, $2\frac{1}{2}$ mm. long.

Hab. Prov. RIKUCHŪ: Mt. Iwate (*G. Toba!* n. 63, Aug. 12, 1904).

Potentilla Matsuokana Makino in Bot. Mag., Tokyo, XVI. (1902) p. 161. = ***Potentilla nivea*** Linn. Sp. Pl. p. 499; Richt. Cod. n. 3799; Houtt. Linn. Pfl.-Syst. VII. p. 165; Poir. Enc. Bot. V. p. 600; Willd.

Sp. Pl. II. p. 1109; Pers. Syn. Pl. II. p. 56; Wahlenb. Fl. Lapp. (1812) p. 146; Spreng. Syst. Veg. II. p. 540; Hook. Fl. Bor. Am. I. p. 195; DC. Prodr. II. p. 571; Reichb. Fl. Germ. Excurs. p. 590; Lehm. Monogr. Gen. Potent. p. 184, et Revis. Potent. p. 165; Ledeb. Fl. Alt. II. p. 260; Regel et Til. Fl. Ajan. p. 84; Torr. et Gray, Fl. N. Am. I. p. 441; Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 190; Maxim. Prim. Fl. Amur. p. 97; F. Schm. Reis. im Amur. u. Ins. Sachal. p. 40; Hook. fil. Fl. Brit. Ind. II. p. 358.

Potentilla nivea a. vulgaris Ledeb. Fl. Ross. II. p. 57.

Potentilla nivea f. 1. Laponica, 2, *vulgaris* Cham. et Schlecht. in Linnæa II. p. 21.

Potentilla fragariæfolia Lessing in herb. reg. Berlin, ex Ledeb. Fl. Ross. II. p. 57.

Potentilla cæspitosa Lehm. 'Add. Ind. Sem. Hort. Hamb. (1849) p. 10'; Revis. Potent. p. 172, tab. 53.

Potentilla argyrophylla var. prostrata Herb. Ind. Or. Hook. f. et Thoms.

Potentilla foliis ternatis, utrinque hirsutis, infra candidis, foliolis ovatis, serratis Gmel. Fl. Sib. III. p. 183, n. 33, tab. 36, fig. 1.

Nom. Jap. *Uraziro-kimbai* (T. Makino).

Add. Hab. Prov. SHINANO: Mt. Shirouma (*Kwan Shimura!* Aug. 1904).

Cicuta virosa Linn. **var. nipponica** (Franch.) Makino.

Cicuta nipponica Franch. in Bull. Soc. Bot. Fr. XXVI. (1879) p. 84; Franch. et Sav. Enum. Pl. Jap. II. p. 736; Yabe, Rev. Umbel. Jap. p. 38.

Nom. Jap. *Ō-zeri*.

Hab. Prov. MUSASHI: Tokyo (*T. Makino!* July 1884).

Euphorbia (Anisophyllum) **hypericifolia** Linn. Cod. n. 3508.

Nom. Jap. *Ō-nishikisō* (B. Hayata).

Hab. Prov. KAI: Kōfu (*Seiichirō Gotō!* herb. Sc. Coll. Imp. Univ. Tokyo, Oct. 17, 1904; *Tomekichi Terasaki!* Nov. 6, 1904).

Introduced! An American plant.

Arenaria (Pentadenaria, Rarifloræ) **Katoana** Makino sp. nov.

Perennial, cæspitoso-diffuse. Stems numerous, gracile; the lower portion

slender, decumbent, ramose, densely matted, with old small leaves; the upper portion ascending or erect, simple, leafy, terete, minutely pubescent often in broad lines with subreflexo-patent subglandular hairs, terminally 1-3-flowered, attaining about 6 cm. in height; internodes usually longer than leaves. Leaves rather dense, erect-patent or patulous, opposite, small, lato-ovate to elliptico-ovate, but often oblong or ovato-oblong and smaller in inferior ones, acute with a callose tip, sessile and very slightly vaginate, rounded obtuse or acute at the base, entire, glabrous, but only slightly ciliated on basal margin, thickish, green, attaining about $6\frac{1}{2}$ mm. long, $4\frac{1}{2}$ mm. broad; midrib straight, glabrous dorsally; veins inconspicuous, irregularly anastomosing. Flower pedicellate, about 6-7 mm. across, white; pedicel erect, strict, minutely pubescent, longer than the calyx, about 5-10 mm. long in flower but attaining about 13 mm. in fruit; bract similar to the superior leaves. Calyx 5-sepaled, glabrous but puberulent at the subconcavo-truncate base; sepals erect-patent in flower but then erect, with a straight or scarcely recurved tip, oblong-lanceolate, acuminate, entire, very loosely ciliated on the basal margin, hardly scarious on margin, concave, herbaceous, somewhat carinate with a glabrous edge dorsally, green, persistent, about $3\frac{1}{2}$ mm. long, $1\frac{1}{2}$ mm. wide; midrib straight; veins irregularly and very loosely anastomosing. Petals 5, longer than sepals, ovato-lanceolate to triangular-lanceolate, subacuminate with an obtuse tip or obtuse, suddenly attenuated into a short claw, entire often subrepand, thinly membranaceous, delicately and loosely vertical-veined, about $4\frac{1}{2}$ mm. long, $1\frac{2}{3}$ - $1\frac{1}{2}$ mm. wide. Stamens 10, very slightly shorter than or equal to petals in height; filament subulate, shortly dilated at the base, glabrous, white; anther orbicular, rosy before bursting. Disk 5-lobed, 5-glandular, thickish, connate with the bases of filaments. Ovary ovoid-globose, substipitate, one-locular, glabrous, green, about $1\frac{1}{2}$ mm. across; carpel not thick; ovules subnumerous, about 16-17, orbiculato-reniform, compressed, with a funicule; styles 3, lower than petals, filiform, longer than the ovary, erect-patent and arcuato-recurved, about $\frac{1}{3}$ -stigmatose; stigma thickish towards the top, subclavate. Capsule ovoid-conical, obtuse, rounded at the base, subsessile, exceeding the persistent calyx, straight, bursting into 6-dentato-lobed valves (narrowly triangular in form with an obtuse apex) towards the top, 6-nerved, about .5 mm. long; carpel smooth, not thick but coriaceous. Seeds rather many, orbiculato-reniform, compressed, ferruginous, minutely tuberculate, angulate or obtuse on dorsal edge, about 1 mm. or less long; funicule thickish.

Nom. Jap. *Katō-hakobe* (nov.).

Hab. Prov. RIKUCHŪ: Mt. Hayachine (*T. Makino!* Aug. 3-4, 1905).

This species comes near to *Arenaria saxifraga* Fenzl, *A. ciliata* Linn., and *A. norvegica* Cunn., but it differs from them in many respects.

I have named it in honour of Viscount Yasuaki Katō.

Bryanthus Gmelini D. Don in Edinb. New Phil. Journ. XVII. (1834) p. 160; DC. Prodr. VII. p. 712; Ledeb. Fl. Ross. II. p. 916; Maxim. Rhod. As. Or. p. 4; de Bois. in Bull. Herb. Boiss. V. (1897) p. 914; Kawakami in Bot. Mag., Tokyo, XV. (1901) p. 218 (Jap.).

Andromeda Bryantha Linn. Mant. p. 238; Richt. Cod. n. 3098; Lamark, Encycl. Méth. Bot. I. p. 156.

Erica Bryantha Thunb. Dissert. Eric. p. 15, n. 8; Willd. Sp. Pl. II. p. 386; Pers. Syn. Pl. I. p. 424; Spreng. Syst. Veg. II. p. 197.

Menziesia Bryantha Swartz in Transact. Linn. Soc. X. (1811) p. 377, tab. 30, fig. B.

Andromeda Bryanthus Pall. Fl. Ross. II. p. 57, tab. 74, fig. 1.

Andromeda musciformis Poir. Encycl. Méth. Suppl. I. p. 353.

Planta Ericæ adfinis, repens, serpyllifolio, flore roseo Steller ex Gmel. Fl. Sib. IV. p. 132, tab. 57, fig. 3.

Nom. Jap. *Chishima-tsugazakura* (T. Kawakami), *Hime-tsugazakura* (T. Makino).

Hab. Prov. RIKUCHŪ: Mt. Hayachine (*U. Faurie* 1894, Herb. Mus. Paris. et Dr.; *T. Makino*! Aug. 3, 1905); Prov. CHISHIMA (KURILE ISL.): Mt. Atoiya in Isl. Etrof (*T. Kawakami* Aug. 1898).

Rare.

Cerastium (Strephodon, Recticapsulares) **oxalidiflorum** Makino sp. nov.

Perennial, caespitose; the flowering stem attaining about 36 cm. in height, the numerous sterile stems much shorter than the flowering stem. Rhizome ramose, creeping, rooting. Stems slender, ascending, often geniculate below, terete, foliate throughout, pubescent with ascending hairs but glanduloso-pubescent above, turgid at nodes, viridescens; internodes attaining about 9 cm. or sometimes 13 cm. in length. Leaves opposite, erect-patent or spreading, lanceolate, but subspathulate in the inferior ones, acuminate or acute, gradually attenuated towards the sessile or subpetiolated bases, entire and ciliated, thinly pubescent with adpressed hairs on both

surfaces, subflaccidly herbaceo-membranaceous, green above, paler beneath, attaining about 8 cm. long, 18 mm. wide, shorter or longer than internodes; midrib prominent beneath; veins inconspicuous superficially, loose, ascendingly erect-patent. Dichasium subnumerous-flowered, twice to thrice divided, extending about 4-9 cm. in flower, glanduloso-pubescent with patent hairs; branches erect-patent, the first lateral branches attaining about $3\frac{1}{2}$ cm. in length in flower but attaining about 7 cm., sometimes 11 cm., in fruit; bracts small, subulate, acuminate or acute, but minute and ovato-oblong with an obtuse apex in the superior ones, glanduloso-ciliated, herbaceous, green, the first pair larger than the rest and 4-8 mm. long but occasionally foliaceous. Flower pedicellate, large, 15-19 mm. across, white; pedicel 9-25 mm. long in flower but attaining about 5 cm. long in fruit. Calyx erect, campanulate, minutely glanduloso-pubescent with patent hairs externally, light green; sepals 5, ovato-lanceolate and glanduloso-ciliated-margined, but oblong-elliptical and hyalino-margined in the inner ones, obtuse, herbaceo-membranaceous, $5\frac{1}{2}$ -6 mm. long, 2-3 mm. broad, 3-nerved, the outer nerves ramose from the base. Petals 5, about $2\frac{1}{2}$ -nearly 3-times as long as the sepals, patulose above, subspathulato-oblong, angustato-cuneately attenuated below and loosely ciliated on margin towards the base, entire, rounded or subretuso-rounded at the apex, 14-16 mm. long, 4-5 mm. wide, 7-nerved, thinly membranaceous between nerves; nerves parallel and elevated on the inner surface, fasciculately ramose into fine veinlets above. Stamens 10, shorter than petals and about $\frac{3}{5}$ - $\frac{2}{3}$ as long as them, about 10 mm. long, the oppositisepalous ones slightly longer; filaments very shortly connate at the base, compressed, white, the oppositisepalous ones subulato-filiform glabrous and thick at the base, the oppositipetalous ones subulate and thinly pilose below; anther elliptico-oblong, or oblong, bifid at both ends, pale (extremely light yellow) with same-coloured pollen, $1\frac{1}{2}$ - $1\frac{3}{4}$ mm. long. Ovary ovoid-oblong, glabrous, yellowish-viridescent, 2- $2\frac{1}{2}$ mm. long, carpel thin and 10-nerved; styles 5, erect, filiform, glabrous, white, equalling the stamens in height, about $6\frac{1}{2}$ mm. long; stigma obliquely internal; ovules many, erect-patent, obovoid. Capsule cylindrical, scarcely curved upwards above, much exserted, $2\frac{1}{2}$ -3-times as long as the persistent calyx, 11-17 mm. long, membranaceous, smooth, simply 10-nerved; the mouth truncate, 10-dentate; the teeth circinato-revolute when dry, not revolute on margins, elliptico-ovate or ovato-oblong, obtuse. Seeds subnumerous, about 20 or a little more in number, obovoid-oval, slightly compressed, tuberculate all over, bay, 1 mm. long.

Nom. Jap. *Tagasode-sō*.

Hab. Prov. SHINANO: Yamato-mura in Mimami-Adzumi-gōri (*D. Takashima!* Aug. 1904, July 1905).

Largest one among Japanese species of *Cerastium*. It is remarkable by having the entire (not bifid) petals. The flower has a resemblance to that of some species of *Oxalis*.

Veronica (*Veronicastrum*) **serpyllifolia** Linn. Sp. Pl. ed. 1, p. 12; Richt. Cod. n. 80; Houtt. Nat. Hist. XXV. (1777) p. 87, et Linn. Pfl.-Syst. V. p. 68; Willd. Enum. Pl. Hort. Reg. Bot. Berol. (1809) p. 21, et Sp. Pl. I. p. 64; Pers. Syn. Pl. I. p. 13; Wahlenb. Fl. Lapp. (1812) p. 5; Vahl, Enum. Pl. I. p. 65; Ait. Hort. Kew. ed. 2, I. p. 30; Spreng. Syst. Veg. I. p. 72; Rœm. et Schult. Syst. Veg. I. p. 102; Hook. Fl. Bor.-Am. II. p. 101; Cham. et Schlecht. in Linnæa, II. p. 558; Reichb. Fl. Germ. Excurs. p. 369; Ledeb. Fl. Alt. I. p. 36, et Fl. Ross. III. p. 248; C. Koch in Linnæa, XVII. p. 286; Nyman, Syl. Fl. Eur. p. 125; Hook. et Arn. Bot. Beech. Voy. p. 378; Benth. in DC. Prodr. X. p. 482; Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 458; A. Gray, Man. Bot. ed. 5, p. 333, et Syn. Fl. N. Am. II. 1, p. 288; Syme, Engl. Bot. VI. p. 157, tab. 978; Herder, Pl. Radd. VI. p. 38; Lindl. Syn. Brit. Fl. ed. 2, p. 188; Benth. Handb. Brit. Fl. ed. 5, p. 335; Hook. fil. Stud. Fl. Brit. Isl. ed. 2, p. 282, et ed. 3, p. 300; Chapm. Fl. S. Un. St. p. 295; Wood, Cl.-Book, p. 528, et Am. Bot. et Fl. p. 229; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 163; Hook. fil. Fl. Brit. Ind. IV. p. 296; Franch. in Bull. Soc. Bot. France, XXXII. p. 27; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 199.

Stems long-creeping, loosely ramose, radicant; flowering stem ascending, attaining about 28 cm. in height including the fruiting raceme (which attains about 20 cm. long). Leaves slightly crenulate, subtriplinerved, attaining 25 mm. long, 16 mm. broad, the lower ones often reflexed. Raceme erect, slender, with small flowers (about 6 mm. across). Capsule broadly orbiculate, emarginate, with a persistent style, equal to or hardly shorter than the persistent calyx.

Nom. Jap. *Hai-kuwagata* (T. Makino).

Hab. Prov. KITAMI in Hokkaidō: Notoro-Sandō (*K. Miyabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 16, 1884); Prov. SHINANO (*K. Matsuoka!* 1901?); Prov. KAI: Mt. Minobu (*Keisaku Tamura!* no. 178, July 1903; *H. Hattori!* 1902); Prov. HIDA: Takayama (*T. Sakane!* no. 187, 1903),

Ōyaga-mura in Ōno-gōri (*T. Sakane!* no. 211, 1904), Yamanokuchi in Ōnata-mura, Ōno-gōri (*T. Sakane!* June 9, 1905).

Asplenium viride Huds, 'Fl. Ang. ed. 1 (1762) p. 385'; Schk. Krypt. Gew. p. 68, tab. 73; Hoffm. Deutschl. Fl. Crypt. (1795) p. 13; Swartz, Syn. Fil. (1806) p. 80; Willd. Enum. Pl. Hort. Reg. Bot. Berol. (1809) p. 1072, et Sp. Pl. V. (1810) p. 332; Wahlenb. Fl. Lapp. (1812) p. 284; Ait. Hort. Kew. ed. 2, V. (1813) p. 516; Spreng. Syst. Veg. IV. (1827) p. 86; Presl, Tent. Pteridogr. (1836) p. 108; Hook. Fl. Bor.-Am. II. (1840) p. 262; Fée, Gen. Fil. (1850-52) p. 190; Ledeb. Fl. Ross. IV. (1853) p. 521; Nyman, Syl. Fl. Eur. (1854-55) p. 432; Mett. Fil. Hort. Bot. Lips. (1856) p. 72, et Farngatt. Aspl. p. 139; Koch, Syn. Fl. Germ. et Helv. ed. 3 (1857) p. 737; Hook. Sp. Fil. III. (1860) p. 144, et Brit. Ferns (1861), tab. 30; Hook. et Bak. Syn. Fil. ed. 2 (1883) p. 195; Milde, Fil. Europ. et Atl. (1867) p. 60; Eat. Ferns N. Am. I. (1879) p. 275, tab. 35, fig. 4; Lowe, F. Brit. et Exot. V. (1872) p. 83, tab. 28; Bedd. Ferns Brit. Ind. tab. 64, et Handb. Ferns Brit. Ind. Ceyl. et Mal. Pen. (1883) p. 143; Hook. fil. Stud. Fl. Brit. Isl. ed. 3 (1884) p. 512; Benth. Handb. Brit. Fl. ed. 5 (1887) p. 563; Clarke, Rev. Ferns N. Ind. in Trans. Linn. Soc. Ser. 2, Bot. I. (1880) p. 477; Christ, Farnkr. d. Erde (1897) p. 191; Diels in Engl. et Prantl, Nat. Pfl.-Fam. I. 4, p. 235.

Asplenium Trichomanes var. *ramosum* Linn.

Asplenium intermedium Presl, 'Del. Prag. I. p. 233,' et Tent. Pteridogr. p. 103, tab. 3, fig. 22.

Asplenium umbrosum Vill. 'Dauph. p. 281.'

Nom. Jap. *Ao-chasenshida* (nov.).

Hab. Prov. SHINANO: Mt. Shirouma, on rocks in alpine or subalpine regions (*Masanao Ogawa!* August 1905).

New to the Flora of Japan. Very rare.

Cryptogramme crispa (Linn.) R. Br. 'in Richardson's Appen. to Franklin's 1st Journ. p. 54'; Hook. Fl. Bor.-Am. II. p. 264; Hook. Sp. Fil. II. p. 128 (*a. f. europæa*), et Brit. Ferns, tab. 39; Hook. et Bauer, Gen. Fil. tab. 115 B; Hook. et Baker, Syn. Fil. ed. 2, p. 144; Hook. fil. Stud. Fl. Brit. Isl. ed. 3, p. 510; Prantl in Engler's Bot. Jahrb. III. p. p. 413; Christ, Farnk. d. Erde, p. 156, fig. 461, et in Bull. Herb. Boiss.

IV. (1896) p. 666; Diels in Engl. et Prantl, Nat. Pfl.-Fam. I. 4, p. 279; Matsum. Ind. Pl. Jap. I. p. 300.

Osmunda crispa Linn. Sp. Pl. p. 1067; Richt. Cod. n. 7764.

Onoclea crispa Swartz 'in Act. Holm. (1789) p. 109'; Hoffm. Deutschl. Fl. Crypt. (1795) p. 11.

Pteris crispa All. 'Fl. Pedem. II. p. 288'; Swartz, Syn. Fil. (1806) p. 101; Houtt. Linn. Pfl.-Syst. XIII, p. 71; Willd. Sp. Pl. V. p. 395; Schkuhr, Krypt. Gew. p. 90, tab. 98; Wahlenb. Fl. Lapp. (1812) p. 286.

Struthiopteris crispa Wallr. in 'Bluff et Fingerh. Compend. Fl. Germ. III. p. 27.'

Phorolobus crispus Desv. in 'Mém. Soc. Linn. Paris, p. 291, tab. 11.'; Fée, Gen. Fl. p. 130, tab. 7 D.

Allosorus crispus Bernh. in Schrad. N. Journ. Bot. I. 2, p. 36; Presl, Tent. Pteridogr. (1836) p. 152; Ledeb. Fl. Ross. IV. p. 525; Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 739; Spreng. Syst. Veg. IV. p. 65; Nyman, Syl. Fl. Eur. p. 434; Milde, Fil. Eur. et Atl. p. 23; Mett. Fil. Hort. Bot. Lips. p. 44; Lowe, Ferns Brit. and Exot. III. p. 93, tab. 34; Benth. Handb. Brit. Fl. ed. 5, p. 558.

Acrostichum crispum Vill. 'Delph. IV. p. 838.'

Blechnum crispum Hartm., 'Fl. Scand. ed. 3, p. 255.'

Nom. Jap. *Rishiri-shinobu* (T. Kawakami), *Iwa-shinobu* (T. Makino).

Hab. Prov. KITAMI in Hokkaidō: Mt. Riishiri in Isl. Riishiri (*U. Faurie* n. 8398; *T. Kawakami!* Aug. 1899; *T. Makino!* Aug. 1903); Prov. RIKUCHŪ: Mt. Hayachine (*T. Makino!* Aug. 4, 1905).

This is found in alpine or subalpine region of the mountains. Quite new to Honsiu (main island) of Japan.

***Viola* (Nomimium) *ibukiana* Makino sp. nov.**

Acaulescent. Rhizome slender, inarticulated, with delicate roots. Leaves few, tufted, erect-patent, long-petiolate, deltoid, $3\frac{1}{2}$ – $4\frac{1}{2}$ cm. long, $2\frac{3}{4}$ –3 cm. wide, acute at the apex, truncato-cordate and shortly decurrent to the petiole at the base, inciso-cleft, crispate, membranaceous, thinly puberulent towards the margin and albescent along veins above, glabrous beneath, with loose veins; petiole slender, much longer than the blade, apterous, glabrous, attaining about 9 cm. in length; stipule membranaceous, loosely papillose on margins, about 2– $2\frac{1}{2}$ mm. long, adnate, but the upper portion slightly free; the free portion erect, deltoid or subulato-deltoid, acute. Pedicel slender, glabrous, but puberulent under the flower, bi-

bracteolate below the middle; bracteoles linear-subulate, acuminate, thin, papilloso-margined below, about 4 mm. long. Sepals subulato-lanceolate, acuminate, glabrous, 3-nerved, the lateral veins with loose venules; auricles conspicuous, subovate, bifid or paucidentate, those of the lateral ones smallest and deltoid with entire margin. Petal.....

Nom. Jap. *Hime-kikubasumire* (nov.).

Hab. Prov. Ōmi: Mt. Ibuki (*Y. Makino!* Aug. 2, 1898).

This comes near to *Viola Tokubuchiana* Makino, but the leaves very different.

Patrinia (Palæopatrinia) **sibirica** (Linn.) Juss. in *Annal. Mus. Par.* X. (1807) p. 311'; DC. *Prodr.* IV. p. 623; Ledeb. *Fl. Alt.* I. p. 131, et *Fl. Ross.* II. p. 426; Lessing in *Linnæa* IX. pp. 154, 157; Spreng. *Syst. Veg.* I. p. 385; Rœm. et Schult. *Syst. Veg.* III. p. 89, et *Mant.* p. 47; Reg. et Til. *Fl. Ajan.* p. 100; Herd. *Pl. Radd.* III. 1, p. 34; Höck in *Engl. et Prantl, Nat. Pfl.-Fam.* IV. 4, p. 176, fig. 61 B-D.

Valeriana sibirica Linn. *Sp. Pl.* p. 34; Richt *Cod.* n. 269, non Willd.

Fedia sibirica Gaertn. *Fruct.* II. p. 37, tab. 86, fig. 3; Vahl, *Enum. Pl.* II. p. 22; O. Kuntze, *Rev. Gen. Pl.* I. p. 302.

Valeriana sibirica β. *humilior* Gmel. *Fl. Sib.* III. p. 123.

Valeriana ruthenica Willd. *Sp. Pl.* I. p. 181; Pers. *Syn. Pl.* I. p. 38; *Bot. Mag.* tab. 2325.

Fedia ruthenica Willd. ex Ledeb. *Fl. Ross.* II. p. 427, non Mirb.

Patrinia ruthenica Juss. l. c.

Patrinia coronata Fisch. 'Hort. Gorenk. ed. 2 (1812) p. 43.'

Valeriana rupestris Uspenski, ex Ledeb. *Fl. Ross.* II. p. 426.

Valerianella lutea Moench. 'Meth. p. 493.'

Dwarf, about 9 cm. high in my specimen. Root elongate, thick, black. Radical leaves cæspitose, numerous, attaining about 5 cm. long, thickish, glabrous but ciliated in long petioles; some elliptical and pinnati-parted or pinnatifid with obtuse pauci-obtuso-dentate linear-oblong linear-obovate or obovate lobes, and some spathulato-oblanceolate with irregularly dentato-serrate margins. Stem erect, simple, bifariously pilose, naked from cauline leaves in my specimen. Corymb small, about 2½ cm. across in my specimen; branches pilose; the inferior bracts opposite, pinnati-parted with linear laciniae, ciliated; bracteoles linear, obtuse, ciliated. Flower short-pedicellate, yellow. Calyx short, with 5 semiorbicular lobes, much enlarged and cup-shaped in fruit and crowned on it, strongly nervate. Corolla with 5

orbiculate lobes. Stamens 4, with the glabrous filiform filament and oblong anther. Ovary broadly obovoid; style erect, simple, included. Fruit broadly obovoid. Ultimate bract adnate to the pedicel with the base, ample in fruit, orbicular and obscurely 3-lobed, membranaceous, reticulato-venose.

Nom. Jap. *Takane-ominaeshi* (nov.).

Hab. Prov. IBURI in Hokkaidō: Mt. Makkarinupuri (commun. *M. Kawasaki*, July 20, 1905).

New to the Flora of Japan. I have a specimen, which I owe to the kindness of Mr. Mitsujiro Kawasaki of Ise.

***Loxocalyx ambiguus* Makino nom nov.**

Leonurus ambiguus Makino in Bot. Mag., Tokyo, XIII. (1899) p. 319.

Perennial, attaining about $7\frac{1}{2}$ decim. in height. Rhizome shortly repent or ascending, ramose, ligneous, densely rooting. Stem erect, slender, loosely ramose with slender simple and erect-patent branches, 4-gonous with angles and flat faces, but the faces often slightly concave in branches, softly piloso-pubescent with sub-reflexed pale hairs on angles but much thinner in faces, viridescent, attaining about 5 mm. across in the lower portion; internodes usually longer than leaves, attaining about 14 cm. long in the main stem. Leaves lato-ovate, but ovate in those of the floriferous ramules, narrowly acuminate-produced with an acute point, truncato-cordate, but truncato-cuneate or broadly cuneate in the superior ones, coarsely dentate with acute or obtuse tipped deltoid or ovato-deltoid teeth, membranaceous, softly pubescent with erect hairs on both surfaces, ciliated, rugose, the lower leaves larger and attaining about $12\frac{1}{2}$ cm. long, 9 cm. broad; midrib and veins impressed above, prominent beneath; veins erect-patent, loose; main veinlets loosely reticulato-anastomosing, but ultimate veinlets inconspicuous; petiole narrow, long and attaining $4\frac{1}{2}$ cm. long, but much shorter in those of the upper leaves, shorter than the blade, softly pubescent with erect-patent hairs, narrowly canaliculate in front. Verticillaster aggregately 1-4-flowered, axillary, extremely shortly peduncled. Flowers erect-patent, very shortly pedicellate; pedicel about $1\frac{1}{2}$ mm. long, puberulent, the lateral ones bracteolate in the middle; bracts and bracteoles minute, opposite, erect-patent, setaceous, green, thinly pubescent, the former about 3 mm. or more long, the latter about $1\frac{1}{2}$ -2 mm. long. Calyx obconically tubuloso-campanulate, unequally 2-lipped, viridescent, rigidly herbaceous, pubescent with erect-patent pale hairs on carinate costas and puberulent

accompanied by minute granular glands between the costas externally, glabrous internally, ciliated on margin, strongly 5-costate and with accessory not conspicuous intermediate veins above, with veins which are transversely spreading above and longitudinally disposed below between costas above, about 9-10 mm. long; posterior lip erect-patent, tridentate with subulate teeth shorter than the tube which is about 6 mm. in length; anterior lip more projecting, erect-patent, bidentate with deltoid or ovato-deltoid teeth which are scarcely shorter than those of the posterior lip; teeth all very acuminate with an aculeate point. Corolla 2-lipped, much exserted, erect, 17-18 mm. long, minutely pubescent and dispersed with minute white granular glands externally, purple but marginate with white, deep-purple-maculate towards the throat in the anterior lip; posterior lip erect, galeate and sheltering the stamens, subrectangular-elliptical, truncato-rounded and subrenate at the apex, ciliated on margin, pubescent with erect-patent hairs towards the centre and elsewhere minutely pubescent with adpressed hairs externally, glabrous internally, with slightly diverging 2 main nerves which are slightly elevated on the dorsal surface, with loose veinlets, 6-7 mm. long, 4-5 mm. wide; anterior lip horizontal and patent, slightly longer than the posterior lip, 3-parted, adpressed-puberulent and minutely granulate-glandular externally, glabrous but hardly granulate-glandular internally, entire and not ciliated on margin, 8-9 mm. long, 8-11 mm. wide; midlobe larger, obovato-elliptical, truncate or truncato-rounded at the apex, 5-6 mm. long, 4-4½ mm. wide, main nerves 3, with loose veinlets; lateral lobes oval, subtruncate or rounded at the apex, somewhat reflexed, about 4 mm. long, 3-3½ mm. wide, main nerves often 3, with loose veinlets; tube exserted above the calyx, narrowly cylindrical, scarcely compressed from front and rear above, somewhat gradually enlarged above, white towards the base, with reflexed and adpressed delicate hairs externally, minutely glandular-hairy above and thinly pilose on the dorsal side and also densely pilose in a ring above the base internally, about 10-12 mm. long, about 2¼ mm. across in the broadest portion. Stamens 4, unequal with somewhat shorter posterior ones, inserted to the throat, erect, slightly lower than or equal to the posterior lip in height; filament subulato-filiform, purpurascent, papilloso-pubescent below, softly villosa-pubescent towards the edges with white crispate hairs; anthers approximate; cells much divaricate vertically, ellipsoid, glabrous, pale but after bursting yellowish-nigrescent, about 1 mm. long, with white pollen. Ovary glabrous; lobes erect, close, oval, slightly compressed, pale-iridescent, purple and glandular in the sub-truncato-rounded top, about ⅔-¾ mm. long; gynophore (disk) not large,

slightly shorter than the ovary, with an erect adpressed ovato-deltoid obtuse anterior lobe; style equal to stamens in height, filiform, glabrous, purpurascenscent, but pale and somewhat curved towards the stigma, about 14 mm. long including the stigma; stigma bifid, branches equal, erect-patent, subulate, acute, about 1 mm. long. Nutlets about 3 mm. long, included within the persistent calyx, erect, obovate, sub-trigonus, often slightly compressed, subtruncato-rounded at the top with obtuse edges, smooth, black; gynophore shorter than nutlets, about $1\frac{1}{3}$ mm. long.

Nom. Jap. *Maneki-gusa*, *Yama-kisewata* (Somoku-Dzusesu, ed. 2, XI. no. 49).

Hab. Prov. MIKAWA: Mt. Ishimaki (*G. Nagura!* Sept. 30, 1896, Aug. 1897, Oct. 3, 1898), Kaifuku, cult. from Mt. Ishimaki (*G. Nagura!* Sept. 15, 1898); Prov. ISE (*H. Nakanishi!*); Prov. KŌDZUKE: Ōsawa-mura in Tano-gōri (*T. Arai!* June 15, 1901); Prov. MUSASHI: Tokyo, cult. from Kodzuke (*T. Makino!* June and August, 1905).

Very closely allied to the Chinese *Loxocalyx urticifolius* Hemsl. (in Journ. Linn. Soc. XXVI. p. 309, tab. 5.), from which it differs by the pubescent habit, shorter leaves, and fewer flowers.

Lamium humile Maxim. (*Ajuga humilis* Miq.) may be probably referred to this genus (*Loxocalyx*) as *L. humilis*.

Rynchospora nipponica Makino in Bot. Mag., Tokyo, XVIII. (1904) p. 145.

Add. Descr. Loosely caespitose, attaining about 6 decim. or more in height, glabrous. Rhizome ascending or repent-ascending, ramose, rooting, terete, smooth, ferruginous, covered with nigrescent adpressed vaginate scales, attaining about 5 mm. across; internodes attaining about $2\frac{1}{2}$ cm. long. Culm erect, green, but orange-coloured towards the base. Leaves erect-patent, the upper ones often slightly exceeding the inflorescence, the basal ones passing into the scales; lamina smooth, green, concolorous, attaining about $3\frac{1}{2}$ decim. long, 12 mm. broad. Inflorescence about 3–11 cm. long; bracts reflexed or patent-reflexed, green, the lowest one attaining about 20 cm. long, the uppermost one setaceous and slightly exceeding the corymb. Corymbs light leather-coloured with viridescenscent colour, forming a terminal and 2–4-axillary heads, the upper heads closely placed.

Hab. Prov. MIKAWA: Futakawa (*J. Umemura!* Sept. 1, 1905).

For the material, my thanks are due to Mr. Jintarō Umemura of the Okazaki Middle School in the province of Mikawa.

Phyllodoce (*Parabyanthus*) **nipponica** Makino sp. nov.

Phyllodoce taxifolia Maxim. Rhodod. As. Or. p. 16, quoad pl. Jap.

Phyllodoce taxifolia Franch. et Sav. Enum. Pl. Jap. I. p. 286, et II. p. 427; Matsum. Cat. Herb. Coll. Sc. Imp. Univ. (1886) p. 119, et Shokubutsu Mei-i (1895) p. 213, n. 2313; Sargent, For. Fl. Jap. p. 10; Yabe, Enum. Pl. Alp. Mount. Shirouma in Bot. Mag., Tokyo, XVII. (1903) p. 23, non Salisb.

Phyllodoce taxifolia Bois. in Bull. Herb. Boiss. V. (1897) p. 914, ex parte? non Salisb.

A small evergreen shrub, 6-30 cm. high, ramose from the base; the main stems ascending, many branched, the largest one about 5 mm. across at the base; branches erect, fastigiate, slender, thinly hispid and often puberulent, or sometimes only puberulent, griseo-umber or sooty sometimes griseo-castaneous as is the main stem, but ferrugineo-fulvous towards the extremities. Leaves patent or erect-patent, sparse, rather dense, shortly petiolate, linear, shortly attenuated to the petiole at the base, obtuse at the apex, spinuloso-serrulate with cartilaginous erect-patent minute teeth on edges throughout, tumid and with margins strongly reflexed to the midrib, glabrous, rigid, glossy, subundulato-convex and deep green and with a channel in centre above, slightly convex (but flat or slightly concave when dried) and paler and with a broad midrib densely covered with minute short white hairs excepting the base beneath, 4-15 mm. long, 1-2 mm. across; petiole adpressed, glabrous, about $\frac{2}{3}$ -1 mm. long, reddish in recent. Flowers turned laterally, rose-coloured, pedicellate; pedicels much exceeding the leaves, axillary, solitary, umbellately 1-9-aggregated at the top of branches, erect, gracile, papilloso-pubescent throughout, 1-3 cm. long, bibracteate at the base; bracts opposite, sessile, embracing the base of pedicels, very concave, broadly ovate, obtuse, entire, glabrous, but ciliolated with white curved hairs on margins, thickish, 1-nerved, persistent. Calyx concave at the base, 5-sepaled; sepals erect-patent, glabrous, subulato-ovate to elliptico-ovate, acutish or obtuse, minutely subciliolated on margins, thickish, sub-3-nerved, $2\frac{1}{3}$ -3 mm. long, viridescent-purple or purple. Corolla broadly open-campanulate, about $2\frac{1}{2}$ -times as long as the calyx, 5-7 mm. long, about 5-6 mm. across, glabrous, 5-lobed; lobes $\frac{1}{2}$ - $\frac{1}{3}$ as long as the tube, reflexed, ovato-semiorbicular, rounded-obtuse at the apex. Stamens 10, included, rather equal in length, shorter than the corolla-tube, $2\frac{1}{2}$ - $3\frac{1}{2}$ mm. long; filament filiform-linear, slightly dilated at the base, glabrous; anther much shorter than the filament, oblong, truncate and bilobed at the apex, shortly biauriculate at the lower end, attached by its back to the filament,

$\frac{3}{8}$ –1 mm. long; cells narrowly oblong, the mouth terminal and oblique. Style erect, straight, narrowly cylindrical, glabrous, included, slightly exceeding the stamens, 2–3 $\frac{1}{2}$ mm. long; stigma depressed, subcapitate. Ovary globose, minutely and densely papillose, 5-locular, 1 mm. and a little more long; ovules numerous, oblong, attached to the thick placental lobes. Capsule on the top of the erect strict and papilloso-hirsute pedicel, globose, accompanied by the persistent calyx, papillose on the surface, 5-sulcate, 3–3 $\frac{1}{2}$ mm. across, with crustaceo-coriaceous carpels. Seeds minute, numerous, fusiform-oblong, finely longitudinal-striate, ferruginous.

Nom. Jap. *Tsuga-matsu*, *Tsuga-zakura*.

Hab. Prov. SHIMOTSUKE: Nikko (*K. Sawada!* herb. Sc. Coll. Imp. Univ. Tokyo, June 14, 1878; *T. Makino!* June 24, 1903), Mt. Shirane in Nikko (*T. Makino!* Aug. 1905); Prov. SHINANO: Mt. Ontake (*R. Yatabe!* herb. ibid. July 28, 1880), Mt. Togakushi (*R. Yatabe* and *J. Matsumura!* herb. ibid. July 12, 1884), Mt. Shirouma (*Y. Yabe!* herb. ibid. Aug. 26, 1902), Mt. Yatsugatake (*Y. Yabe!* herb. ibid. Aug. 18, 1902); Prov. KAGA: Mt. Hakusan (*R. Yatabe* and *J. Matsumura!* herb. ibid. Aug. 8, 1881); Prov. ETCHŪ: Mt. Tateyama (*R. Yatabe* and *J. Matsumura!* herb. ibid. July 24, 1884); Prov. RIKUCHŪ: Mt. Iwate (*G. Nakahara!* herb. ibid. Aug. 1, 1903); Prov. OSHIMA in Hokkaidō: Mt. Komagatake (*Y. Tokubuchi!* Aug. 19, 1888).

It is very closely allied to the North-American (occidental) *Phyllodoce empetriformis* D. Don (= *Menziesia empetriformis* Swartz = *Bryanthus empetriformis* A. Gray). This species belongs to the section *Parabryanthus*, and thus the old world, not only Japan, added a new section to *Ericaceae*.

Phyllodoce (Eu-Phyllodoce) *cærulea* (Linn.) Bab. 'Man. Brit. Bot. ed. 1 (1843) p. 194'; Gren. et Godr. 'Fl. France, II. (1850) p. 434'; Hook. fil. Stud. Fl. Brit. Isl. ed. 3, p. 254; Britt. et Br. Ill. Fl. N. Un. St. et Can. II. p. 565, fig. 2760.

Andromeda cærulea Linn. Sp. Pl. p. 393; Richt. Cod. n. 3095; Houtt. Nat. Hist. XXIII. (1775) p. 81, et Linn. Pfl.-Syst. III. (1778) p. 565.

Menziesia cærulea Swartz in Trans. Linn. Soc. X. (1811) p. 377, tab. 30, fig. A; Wahlenb. Fl. Lapp. (1812) p. 105; Spreng. Syst. Veg. II. p. 202; Hook. Fl. Bor.-Am. II. p. 39; Cham. et Schlecht. in Linnæa, I. p. 515; Reichb. Fl. Germ. Excurs. p. 417; Lindl. Syn. Brit. Fl. ed. 2, p. 173; Cyme, Engl. Bot. VI. p. 34, tab. 886; Benth. Handb. Brit. Fl. ed. 5, p. 283.

Erica caerulea Willd. Sp. Pl. II. (1799) p. 393; Pers. Syn. Pl. I. p. 425.

Andromeda taxifolia Pall. Fl. Ross. I. 2 (1788) p. 54, tab. 72, fig. 2.

Phyllodoce taxifolia Salisb. 'Parad. Lond. tab. 36 (1806)'; DC. Prodr. VII. p. 713; Ledeb. Fl. Ross. II. p. 916; Reg. et Til. Fl. Ajan. p. 110; Nyman, Syl. Fl. Eur. p. 316; Fr. Schm. Reis. im Amur. u. Ins. Sachal. p. 54; Herd. Pl. Radd. IV. 1, p. 40 (*a. genuina*); Maxim. Rhod. As. Or. p. 6; A. Gray, Man. Bot. ed. 5, p. 297; Drude in Engl. et Prantl, Nat. Pfl.-Fam. IV. 1, p. 40, fig. 26 A B, et fig. 20 C.

Phyllodoce taxifolia Bois. in Bull. Herb. Boiss. V. (1897) p. 914, ex parte? non Salisb.

Bryanthus taxifolia A. Gray 'in Proc. Am. Acad. VII. (1868) p. 368,' et Syn. Fl. N. Am. II. 1, p. 37; Miyabe, Fl. Kuril. Isl. p. 247.

Menziesia taxifolia Robbins, ex Wood, Cl.-Book Bot. p. 489, et Bot. et Fl. p. 201.

Erica arctica Waitz, 'Besch. Gatt. Art. Heid. p. 189.'

Andromeda Daboecia Pall. Fl. Boss. II. p. 57, non Linn. excl. syn. Buxb.

Erica Daboecia Georgi, 'Besch. Russ. Reich. III. 4, p. 936.'

Sepals subulato-lanceolate, acuminate, glandular-pubescent. Corolla ellipsoid-urceolate, more or less glandular-puberulent, about 10-11 mm. long, rosy.

Nom. Jap. *Ezo-tsugazakura* (nov.).

Hab. Prov. ISHIKARI in Hokkaidô: Mt. Optateshike (*Tsutomu Miyake!* Aug. 27, 1903); Prov. IBURI: Mt. Makkarinupuri (*Sôtarô Awano!* July 24, 1905; *R. Suzuki!* Aug. 6, 1905).

The occurrence of this species in Honshû (the main island of Japan) is not yet certain.

Phyllodoce (Eu-Phyllodoce) **aleutica** (Spreng.) Makino.

Menziesia aleutica Spreng. Syst. Veg. II. (1825) p. 202; Cham. et Schlecht. in Linnæa, I. p. 515; Hook. Fl. Bor.-Am. II. p. 40.

Bryanthus aleuticus A. Gray 'in Proc. Am. Acad. VII. p. 377,' et Syn. Fl. N. Am. II. 1, p. 37.

Phyllodoce taxifolia β . *aleutica* Herd. Pl. Radd. IV. 1, p. 55.

Phyllodoce Pallasiana D. Don 'in Edinb. New Phil. Journ. XVII. (1834) p. 160'; DC. Prodr. VII. p. 713; Ledeb. Fl. Ross. II. p. 917; Maxim. Rhod. As. Or. p. 6; Franch. et Sav. Enum. Pl. Jap. I. p. 286; Bois. in Bull. Herb. Boiss. V. (1897) p. 914.

Menziesia phyllicifolia Fisch. in Hook. herb. ex Hook. Fl. Bor.-Am. II. p. 40.

Erica cerulea Willd. herb. n. 7477, fol. 5, ex Ledeb. Fl. Ross. II. p. 917.

Nom. Jap. *Ao-no-tsugazakura*, *Aobana-no-tsugazakura*, *Ô-tsugazakura*, *Ô-tsugamatsu*, *Hakusan-gaya*.

Hab. Prov. SHINANO: Mt. Ontake (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 2, 1880; *K. Yasawa!* Aug. 1893), Mt. Komagatake (*R. Yatabe!* herb. ibid.), Mt. Shirouma (*Y. Yabe!* herb. ibid. Aug. 26, 1902); Prov. KAGA: Mt. Hakusan (*R. Yatabe* and *J. Matsumura!* herb. ibid. Aug. 8, 1881); Prov. ETCHÛ: Mt. Tateyama (*R. Yatabe* and *J. Matsumura!* herb. ibid. July 23, 1884), Prov. UZEN: Mt. Gassan (*R. Yatabe* and *S. Ôkubo!* herb. ibid. July 23, 1887); Prov. UGO: Mt. Chôkai (*R. Yatabe* and *S. Ôkubo!* herb. ibid. July 28, 1887; *S. Ishidzuka!* herb. ibid. Aug. 11, 1905); Prov. RIKUZEN: Mt. Katta (*Y. Yabe!* herb. ibid. Aug. 17, 1898); Prov. IWASHIRO: Mt. Iide (*G. Nakahara!* herb. ibid. Aug. 10, 1904); Prov. RIKUCHÛ: Mt. Kurikoma (*T. Makino!* Aug. 1890); HOKKAIDÔ (*L. Boehmer!* herb. ibid. June 1874); Prov. CHISHIMA: Isl. Shimushu (*K. Yendô!* herb. ibid. July 20, 1903).

Morus rubra Linn. Sp. Pl. p. 986; Poir. Enc. Bot. IV. p. 377; Willd. Sp. Pl. IV. p. 369; Pers. Syn. Pl. II. p. 558; Spreng. Syst. Veg. I. p. 492; Michx. Fl. Bor.-Am. II. p. 179, et N. Am. Sylv. III. p. 42, tab. 116; Nutt. Gen. N. Am. Pl. II. p. 209; Seringe, Descr. et Cult. d. Mûr. p. 223, tab. 20; Bureau in DC. Prodr. XVII. p. 245; A. Gray, Man. Bot. ed. 5, p. 444; Engler in Engl. et Prantl, Nat. Pfl.-Fam. III. 1, p. 73; Britt. et Br. Ill. Fl. N. Un. St. et Can. I. p. 528, fig. 1257.

var. japonica Makino var. nov.

Morus nigra Matsum. in Bot. Mag., Tokyo, XVI. (1902) p. 18, non Linn. A tree, often large. Stigmatic arms slender, subulato-filiform, attenuated towards the apex, longer than the ovary, softly pubescent throughout. Otherwise as in the type.

Nom. Jap. *No-guwa* (in prov. Nagato), *Yama-guwa* (in prov. Bitchû and Kii), *Ke-guwa* (nov.).

Hab. Prov. NAGATO: Misumi-mura in Ôtsu-gôri (*D. Nikai!* herb. Sc. Coll. Imp. Univ. Tokyo, Sept. 22, 1895, April 28, 1902); Prov. BITCHÛ: Hôkinosaka in Higashinariwa-mura, Kawakami-gôri (*Z. Yoshino!* May, 17, 1904, May 12, 1905), Near Fuse in Fûka-mura, Kawakami-gôri (*Z. Yoshino!*

May 10, 1905); Prov. KII: Foot of Mt. Katsuraki in Naka-gôri (*T. Yamashita*! July 1905).

Yama-guwa is the popular name to *Morus indica* Linn. in more common use.

Thea sinensis Linn. var. **rosea** Makino var. nov.

Thea rosiflora Matsum. Shokubutsu Mei-i (1895) p. 292, n. 3104, non O. Kuntze.

Leaves dark green. Petals rosy. Carpels more or less purpurascens.

Icon. Hanzô-Dzûfu, LXX. fol. 20 recto (by Franchet in his Enum. Pl. Jap. I. p. 60, this plant was wrongly referred to *Thea maliflora* Seem. = *Thea rosiflora* O. Kuntze).

Nom. Jap. *Benibana-cha*.

Hab. Prov. MUSASHI: Komaba, Bot. Gard. Agric. Coll., cult. (*T. Makino*! Oct and Nov. 8, 1900, Nov. 1905).

A garden variety.

In Japan, I have not yet found *Thea rosiflora* O. Kuntze (= *Camellia roseiflora* Hook. = *Camellia maliflora* Lindl. = *Thea maliflora* Seem.) which is said to have a resemblance to *Thea japonica* Nois (= *Camellia japonica* Linn.).

Thea Sasanqua (Thunb.) Nois. var. **vernalis** Makino var. nov.

Branches terete, fulvous, glabrous. Leaves petiolate, elliptical-oblongate, acuminate with an obtuse point, cuneately attenuated below, crenulato-serrulate with a mucronate tip, coriaceous, glabrous, green and shining above, paler beneath; about $3\frac{1}{2}$ - $7\frac{1}{2}$ cm. long, $1\frac{1}{2}$ -3 cm. wide; midrib prominent beneath, glabrous; veins about 6-9 on each side, inconspicuous superficially; petiole entirely glabrous, 3-9 mm. long. Flowers terminal and axillary, solitary, about 6-7 cm. across, white, semidouble. Sepals sericeous dorsally and scales also more or less so. Petals subnumerous, obovato-oblong or oblong, emarginate or retuse, about $3\frac{1}{2}$ cm. long. Stamens numerous, connate into a few bundles, shorter than petals. Styles 3, connate in the greater portion, slightly shorter than stamens. Ovary villosa-tomentose.

Nom. Jap. *Haru-sazanqua* (nov.).

Hab. Prov. MUSASHI: Tokyo, cult. (*T. Makino*! March 1896).

This differs from the type of *Thea Sasanqua* (Thunb.) Nois. by the glabrous branch, larger and more shining leaves, entirely glabrous petiole, and

flowering time; probably a hybrid between *Thea Sasanqua* and *T. japonica* with the characters of *T. Sasanqua* more predominating.

Dendrobium tosaense Makino, Ill. Fl. Jap. I. n. 8 (1891) p. 1, tab. 46.

An epiphytic orchid. Rhizome not long, creeping, densely rooting, attaining about 4 cm. long; roots fibrous, filiform. Stems few to several to a rhizome, closely placed, tufted, elongate, slender, simple, many-articulated, often somewhat contracted at nodes, many-foliate, but old ones bare from fallen leaves, shortly and ovoidly thick at the base, 2-85 cm. long, a new stem produced annually outside that of the preceding year; internodes cylindrical, scarcely enlarged above, sub-carnose, at length striate, dark-purple or dark-iridescent within the sheath, about 1-4 cm. long. Leaves alternate, distichous, loose, lanceolate or narrowly lanceolate, acute, shortly attenuated to a very short petiole or sessile at the base, smooth on the entire margins, glabrous, smooth, membranaceo-coriaceous, green above, slightly lighter beneath, somewhat channelled in centre above, about $2\frac{1}{2}$ - $7\frac{1}{2}$ cm. long, $\frac{4}{5}$ - $1\frac{2}{3}$ cm. wide, evergreen; veins close but inconspicuous superficially in recent, transverse veinlets loose and not conspicuous; sheath membranaceous, closely enclosing the internode, iridescent with purplirrescent colour, but alio-cinereous or cinereous-avellaneous in age. Racemes lateral on the upper and sometimes also middle portions of the stem, one to a node, simple, laxly 2-5-flowered; rachis gracile, flexuous, smooth, glabrous, 3- $7\frac{1}{2}$ cm. long, with membranaceous minute scaly sheaths at the base; bracts minute, subulate, acute, shorter than pedicels. Flowers medium-sized, yellowish-iridescent. Perianth sub-patent, acute. Sepals: the upper one lanceolate; lateral ones broader, adhering with a large foot at the column and enclosing the base of the labellum. Petals smaller than sepals, lanceolate. Labellum standing at the end of the foot of the column, recurved, obovate, acute, the lower portion attenuated towards the base and thicker in the middle with slightly inflexed margins, the upper portion patent, dark-purple in the central portion internally. Column short, erect, provided with a thick basal foot which adheres with the base of the lateral sepals by its long back; clinandrium concave, with three erect processes on margin. Anther terminal, ovate, bifid at the apex, adhering to the dorsal process of the clinandrium by a point in the back. Pollinia 4, in two pairs, waxy. Ovary filiform, pedicellate. Capsule obovoid-oblong, attenuated below to a pedicel $1\frac{1}{2}$ - $2\frac{1}{3}$ cm. long, shortly attenuated above, smooth, 3-ribbed, 2- $3\frac{1}{2}$ cm. long, 9-13 mm. across. Flowers in August.

Nom. Jap. *Kibana-no-sekkoku*.

Hab. Prov. TOSA: Kôchi (*T. Makino!* Nov. 1895; *S. Okamura!* Nov. 1905); Prov. SASTUMA: Shiroyama in Kagoshima (*T. Uchiyama!* herb. Sc. Coll. Imp. Univ. Tokyo, Nov. 25, 1909); AMAMI-ÔSHIMA (*K. Fukuzo!* Oct. 1905).

This is uncommon in Japan, and it is unquestionably very distinguished from *Dendrobium moniliforme* Sw., a common species in this country, by its inflorescence, perianth, labellum, colour of the flower and flowering time. And the leaves are broader and the stem is longer than in the latter. According to Mr. S. Ôkubo, this species was also found by him on Mt. Hachijô-Fuji in Hachijô Isl., 1887.

Equisetum (*Enequisetum*) **sylvaticum** Linn. Sp. Pl. p. 1061; Richt. Cod. n. 7729; Schk. Crypt. Gew. p. 170. tab. 166; Hoffm. Dents. Fl. Crypt. p. 3; Willd. Sp. Pl. V. p. 3, et Enum. Pl. Hort. Bot. Berol. p. 1065 Spreng. Syst. Veg. IV. p. 10; Wahlenb. Fl. Lapp. p. 296; Reichb. Fl. Germ. Excurs. p. 154; Hook. Fl. Bor.-Am. II. p. 269, et Brit. Ferns, tab. 61; A. Braun in Flora (1839) p. 397; Ledeb. Fl. Alt. IV. p. 321, et Fl. Ross. IV. p. 487; Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 723; Milde ('Monogr. Equis. tab. 9-10,' et Fil. Eur. et Atl. p. 222; A. Gray, Man. Bot. ed. 5, p. 654; Maxim. Prim. Fl. Amur. p. 334; Fr. Schm. Reis. im Amur. u. Ius. Sachal. pp. 73, 204; Benth. Handb. Brit. Fl. ed. 5, p. 550; Hook. f. Stud. Fl. Brit. Isl. ed. 2, p. 501, et ed. 3, p. 522; Korsh. in Act. Hort. Petrop. XII. p. 426; Baker, Handb. Fern Allies, p. 2; Sadeb. in Engl. et Prantl, Nat. Pfl.-Fam. I. 4, p. 545; Britt. et Br. Ill. Fl. N. Un. St. et Can. I. p. 36, fig. 79.

Equisetum capillare Hoffm. l. c.

Nom. Jap. *Fusa-sugina* (nov.).

Hab. Prov. SHIRIBESHI in Hokkaidô: Mt. Iwô-zan (*S. Awano!* July 9, 1905).

New to the Flora of Japan.

Loxogramme salicifolia Makino.

Gymnogramme salicifolia Makino, Phanerog. et Pterid. Jap. Ic. III I. n. 7 (1899) tab. 34; Matsum. Ind. Pl. Jap. I. p. 389.

Gymnogramme lanceolata Catal. Pl. Herb. Coll. Sc. Imp. Univ. Tokyo (1886) p. 256; Makino in Bot. Mag., Tokyo, X. (1896) p. 178, non Hook.

Rhizome slender, repent, scaly, rooting; roots with castaneo-purpurascent root-hairs; scales densely placed at the base of the stipe, long-ovate, subulato-ovate, or ovato-lanceolate, acuminate, entire, membranaceous, dark-ferruginous, often curly when dry, with fine and close areoles. Leaves loosely placed on the rhizome, angustato-lanceolate or linear-lanceolate, but often lanceolate in the sterile one, entire, more or less recurved on margin when dry, shortly acuminate with an obtuse tip, gradually attenuated below to a stipe, naked on both sides as well as the stipe, thick, coriaceous but flaccid in recent, 9–28 cm. long including the stipe, the sterile one attaining about 2 cm. wide, the fertile one narrower than the sterile one and 5 mm. wide when is narrowest; venation immersed; midrib slender, straight, prominent above; veins erect-patent, loose; veinlets forming oblong or elongate areolæ, those between veins parallel to them in 2 or 3 rows, often with simple or furcate free venule within; stipe slightly compressed, marginate with slender wings on both sides, attaining about 6 cm. long. Sori in the middle and upper portions, arranged midway between the midrib and margins, or slightly nearer to the margin, straight, linear, sometimes oblong-linear, strongly oblique and only approximate at the upper and lower ends each other, or sometimes arranged nearly end to end in single vertical rows, placed between veins and parallel to them, yellow in recent. Sporangia with a long pedicel.

Nom. Jap. *Iwayanagi-shida*.

Hab. Japan, middle and southern.

This Fern is very closely allied to *Loxogramme lanceolata* (Swartz) Presl (= *Gymnogramme lanceolata* Hook. = *Polypodium Loxogramme* Mett.), but the latter one has the sori nearer to the midrib than to the margin and areolæ almost without free venule; this is not found in Japan so far as I know. The species collected by Wilford in Tsushima and by Oldham in Nagasaki, and quoted under *Gymnogramme lanceolata* by Hooker in his *Species Filicum*, V. p. 157, may be probably identical with ours.

***Loxogramme minor* (Baker) Makino.**

Gymnogramme lanceolata var. *minor* Baker ex Maximowicz in litt. 1889; Makino in *Bot. Mag.*, Tokyo, X. (1896) p. 178.

Polypodium Loxogramme var. *minor* Matsum. *Ind. Pl. Jap.* I. (1904) p. 337.

Polypodium yakushimae Christ in *Bull. Herb. Boiss.* 2 Ser. I. (1900) p. 1014; Matsum. l. c. p. 393.

A little Fern, forming a loose mass. Rhizome gracile, long-creeping, rooting; scales denser at the base of the stipe, linear-subulate to subulate, long-acuminate, thin, nigro-castaneous, with fine and distinct areoles. Frond loosely placed on the rhizome, spatulate to linear-spatulate, obtuse, gradually attenuated below and very angustately decurrent to a narrow stipe, entire or sometimes subrepand, sometimes more or less irregular in form, attaining about $10\frac{1}{2}$ cm. long including the stipe, 3–12 mm. wide, coriaceous-membranaceous, herbaceous in recent, glabrous on both sides; midrib narrow, prominent above; veins hidden, the areolæ oblong to elongately oblong, usually hexagonal, large in proportion, without any free veinlet. Sori in the upper portion of the frond, oblique, arranged nearer to the midrib than to the margin, oblong-linear or oblong, straight or somewhat curved outwards, 1–6 on each side. Sporangia: the pedicel longer than the globose case.

Nom. Jap. *Hime-sajiran*.

Hab. Prov. KAGA: Yumoto on Mt. Hakusan (*R. Yatabe* and *J. Matsu-mura*! herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 6, 1881); Prov. TOSA: Suginokawa (*T. Makino*! Nov. 1885), Hayama-gô (*T. Makino*! 1892); Prov. IYO: Nishinokawa (*K. Watanabe*! Sept. 25, 1891); Prov. IDZU: Mt. Amagi (*S. Matsuda*! Dec. 29, 1893; *Z. Horiye*! May 14, 1905); Prov. KII: Mt. Kôya (*H. Nakanishiki*! Aug. 1905); Prov. SATSUMA: Isl. Yakushima (*U. Faurie*! July 1900).

***Polypodium japonicum* (Franch. et Sav.) Makino.**

Polypodium vulgare var. *japonicum* Franch. et Sav. Enum. Pl. Jap. II. (1879) p. 244; Matsum. Catal. Herb. Coll. Sc. Imp. Univ. Tokyo (1886) p. 255, Shokubutsu Mei-i (1895) p. 230, et Ind. Pl. Jap. I. (1904) p. 340.

Polypodium Fauriei Christ in Bull. Herb. Boiss. IV. (1896) p. 672, et Frank. d. Erde (1897) p. 83, in nota; Diels in Engl. et Prantl, Nat. Pfl.-Fam. I. 4, p. 312; Matsum. Ind. Pl. Jap. I. p. 334.

Nom. Jap. *Oshagoji-denda*, *Oshagoji-denda*.

Hab. Japan, widely distributed.

The peculiarity of this fern is the circinate state of the frond in drying.

***Sciaphila* (Eusciaphila) *tosaensis* Makino sp. nov.**

A little monœcious leafless perennial, subhyaline, glabrous, purplish, about 5–10 cm. high. Rhizome subterranean, narrow, laxly with lato-

subulate acute and concave scales; roots fibrous, elongate, filiform, loose or fasciculate, villose with white spreading hairs. Stem erect, usually simple, or sometimes with a branch, straight or more or less irregularly curved, often with very distantly placed a few adpressed concave subulate or ovato-subulate scales about 3 mm. long, terete and subangulate, $\frac{1}{2}$ - $1\frac{1}{2}$ mm. across. Raceme terminal, simple, laxly and alternato-subsecundly about 3-8-flowered, male above and female below, 1- $3\frac{2}{3}$ cm. long; rachis straight or reflexed, gracile; bract subtending the pedicel, erect-patent, sessile, ovato-subulate to oval, acute, entire or nearly so, very concave, membranaceous, shorter or longer than the pedicel, shortly projected at the base in the lower ones, $1\frac{1}{3}$ - $3\frac{1}{2}$ mm. long. Flowers (male and female) about 7 mm. across; pedicel erect or ascending, gracile, straight or substraight, $\frac{1}{2}$ -8 mm. long. Perianth patent, deeply 6-parted, sometimes abnormally 4-parted in the superior one, thin, glabrous, densely celluloso-subbullate, persistent; lobes narrowly subulate, gradually filiform towards the naked apex, entire, 1-nerved, about 3 - $3\frac{1}{2}$ mm. long, $\frac{2}{5}$ - $\frac{3}{5}$ mm. broad at the base. Stamens 3, short; filaments thick, minutely papillose, connate below, the free portion very short and lobe-form; anther opposite to perianth-lobes, terminal, sessile, slightly depressed, transversely elliptical or oval-elliptical, 1-celled, extrorse, dehiscing transversely, about $\frac{1}{2}$ mm. long; pistillode none. Ovaries numerous, densely aggregated into a sessile globose head shorter than the perianth and about $1\frac{2}{3}$ -2 mm. across, sessile on the elevated globular receptacle, obliquely obovoid, minutely granulated, about $\frac{1}{2}$ mm. long; ovule solitary, obovoid, erect; style ventral, inserted to the infra-medium, slightly exceeding the ovary, clavellato-filiform, celluloso-bullate, about $\frac{3}{5}$ mm. long; stigma simple, obtuse, spiculo-scabrous. Carpels numerous, conglomerate into a globose sessile head about 3-4 mm. across, accompanied by the persistent perianth below and also by persistent style which much shorter than carpels, obovoid, attenuated towards the base, rounded at the top, sessile on the elevated central receptacle, minutely papilloso-verruculose above, 1-seeded, about $1\frac{1}{2}$ mm. long; pericarp thin, densely cellulose, dehiscing vertically towards the top. Seed oblong-obovoid, rounded at the top, erect, minutely striate vertically under lens, ferruginous, about 1 mm. long.

Nom. Jap. *Ujematsu-sō*, *Tokihisa-sō* (nov.).

Hab. Prov. TOSA: Chigaidō-yama in Kami-yasu, Yasu-mura, Kami-gōri (*Yoshima Tokihisa!* July 26, 1905; *Yeijirō Ujematsu!* Sept. 10, 1905).

This species seems to me to stand near by *Sciaphila secundiflora* Thwaites, a Ceylon plant. It is the second species of this family found

in Japan, and was first discovered by Mr. Yoshina Tokihisa, a student of Kōchi Normal School in the province of Tosa, Shikoku.

Sciaphila (Hyalisma) **japonica** Makino in Bot. Mag., Tokyo, XVI. (1902) p. 211.

Hab. Prov. ISE: Hongō in Kusu-mura, Miye-gōri (*K. Teraoka*, *K. Imai*, *Y. Uyematsu*! Sept. 7, 1902; *K. Imai*! Aug. 16, 1905; *T. Makino*! Oct. 1905), Takakura-yama in Yamada (*K. Kobayashi*! Sept. 24, 1905); Prov. OWARI: Akitsu-mura (*G. Kawasaki*! July 5, 1902), Akaha-mura (*S. Gotō*! Aug. 21, 1905); Prov. TOSA in Shikoku: Chigaidō-yama in Kamiyasu, Yasu-mura, Kami-gōri (*Y. Tokihisa*! July 26, 1905); Prov. HIGO in Kiusiu: Mt. Kibō (*H. Kōdzuma*! Aug. 31, 1905).

Saccolabium Toramanum Makino sp. nov.

A little epiphytic orchid, attaining about 7 cm. long, glabrous. Rhizome usually simple, creeping, gracile, filiform, radicaunt with loose fibrous pale roots, the old portion naked from fallen leaves, enclosed with short sheaths of leaves throughout. Leaves small, uniform, distichous, spreading, many, subclosely arranged, elliptical to oblong-elliptical or ovato-elliptical, acuto-cuspidate or acuminato-cuspidate, entire, acute or sometimes obtuse at the base, very shortly petiolate, articulated upon the sheath, coriaceous, channelled, green and purple-maculate, 3-nerved, 5–11 mm. long, $2\frac{1}{2}$ –5 mm. broad, persistent. Raceme short, shorter than leaves, approximately 2–6-flowered, peduncled; rachis short, shorter than the peduncle, often flexuous, angulate, 1– $2\frac{1}{2}$ mm. long; bract subtending the pedicel, spreading or erect-patent, lato-subulate, acutish, entire, concave, membranaceous, nerveless, persistent, $\frac{2}{3}$ – $1\frac{1}{4}$ mm. long; peduncles lateral, with 2–3 scales; scales minute, membranaceous, loose, vaginate, obliquely truncate, acutish at the apex, 1-nerved or nerveless, $\frac{1}{2}$ –2 mm. long, the superior one or two sometimes evaginate and lato-subulate being bract-like. Flower minute. Perianth patulous, free, entire, one-nerved, concave, membranaceous, thick in centre and carinate dorsally, yellowish-viridescent and blotched with purple. Sepals: the upper one subovato-elliptical, obtuse, hardly longer and broader than the lateral ones, about $2\frac{2}{3}$ mm. long; lateral ones subobovato-oblong, acutish, about $2\frac{1}{2}$ mm. long. Petals slightly shorter than sepals, subovato-elliptical, obtuse, about 2 mm. and a little more long. Labellum somewhat shorter than the perianth, slightly adhering with the base of the

column, calcarate, about 4 mm. long including the calcar; limb 3-lobed, about 2 mm. long; midlobe ample, emarginato-reniform, rounded on both sides, scarcely subrenulate on margin, vertically carinate dorsally, membranaceous, about $1\frac{1}{2}$ mm. long, 3 mm. broad; lateral lobes much smaller, erect, subovate, entire, duplicate to the basal part of the midlobe at the apex; disk thick, ovato-deltoid, pubescent or nearly so; calcar straight, parallel to the ovary, cylindrical, obtuse, equal to the limb and nearly equal to the perianth in length, membranaceous, smooth and naked internally, with a few and very loose veins. Column short, stout, erect, dorso-ventrally compressed; clinandrium obliquely truncate, subdeltoid, pyramidally convex in centre; rostellum distinctly projected, bifid; stigma rounded. Anther thinly membranaceous, slightly depressed, hardly 2-lobed on face, broadly produced in front, glabrous. Pollinia 2, in pair, ovoid, about $\frac{2}{3}$ mm. long; caudicle lato-linear-subulate, thin, longer than pollinia, about $\frac{3}{3}$ mm. long; retinaculum sagittate. Ovary clavato-filiform, about 3-4 mm. long including the pedicel. Capsule oblong, about 9 mm. long, pedicellate.

Nom. Jap. *Momi-ran* (T. Yoshinaga).

Hab. Prov. Tosa: Mt. Yanaze (*Torama Yoshinaga!* Oct. 1904).

A rare species. It was found on branches of some species of *Quercus* among *Abies* forest. It is nearly allied to *Saccolabium Matsuran* Makino (in Bot. Mag., Tokyo, XVI. 1902, p. 12), which differs in the forms of leaves and labellum. *Momi-ran* means "Abies Orchid." The specific name is in honour of Mr. Torama Yoshinaga.

Potamogeton lucens Linn. var. **teganumensis** Makino var. nov.

Stem attaining about 2 m. or more in length, many-branched; branches more slender, 1- $1\frac{1}{2}$ mm. across. Leaves smaller, oblong to oblong-lanceolate, obtuse or acute with a cuspidate point at the apex, acute or subobtuse at the base, 3-nerved on each side often with a few accessory nerves, serrulate on margin, translucent, about 4-14 cm. long, $1\frac{1}{3}$ - $2\frac{1}{3}$ cm. broad; petiole 2-5 mm. long; stipule $1\frac{1}{2}$ -4 cm. long. Peduncle about 8 cm. long, 3 mm. in diameter. Spike smaller, about $4\frac{1}{2}$ cm. long and 5-6 mm. across in fruit. Flower smaller, about 4 mm. across. Perianth-lobes about $1\frac{2}{3}$ mm. long. Achene smaller, about 2 mm. long exclusive of the short beak.

Nom. Jap. *Gashā-moku*, *Chakkara-moku*.

Hab. Prov. SHIMOOSA: Lake Teganuma (*K. Yamadzuta!* Aug. 1904, Aug. 1905; *H. Nakano!* Aug. 1905).

Smaller than the type in all respects. This is applied to the soil as a manure by the farmers who are living by the lake.

Eleocharis (*Eleogenus*) **capitata** (Linn.) R. Br. Prodr. Fl. N.-Holl. p. 225; Rœm. et Schult. Syst. Veg. II. p. 153; Kunth, Enum. Pl. II. p. 150, excl. syn. plur.; Miq. Fl. Ind. Bat. III. p. 299; Steud. Syn. Pl. Cyper. p. 78; Clarke in Hook. Fl. Brit. Ind. VI. p. 627, et in Journ. Linn. Soc. XXXIV. p. 50, XXXVI. p. 227; Trim. Handb. Fl. Ceyl. V. p. 72; Britt. et Br. Ill. Fl. N. Un. St. et Can. I. p. 250, fig. 583.

Heleocharis capitata Boeck. in Linnæa, XXXVI. p. 461; F. Muell. Fragm. Phyt. Austral. VIII. p. 240; Benth. Fl. Austral. VII. p. 296; Henry, List. Pl. Formos. p. 104.

Eleogenus capitatus Nees 'in Wight, Contrib. Bot. Ind. p. 112,' et in Linnæa, IX. p. 294.

Scirpus capitatus Linn. partim; Willd. Sp. Pl. I. p. 294, partim; Vahl, Enum. Pl. II. p. 250, partim; Roxb. Fl. Ind. I. p. 215; Benth. Fl. Hongk. p. 394; O. Kuntze, Rev. Gen. Pl. II. p. 757.

Scirpus caribæus Rottb. Descr. et Ic. Pl. p. 46, tab. 15, fig. 3.

Scirpus Brownei Spreng. Syst. Veg. I. p. 204.

Scirpus palmaris Willd. ex Schult. Syst. Veg. Mant. II. p. 84, in obs.

Scirpus impar Ehrenb. ex Boeck. l. c. p. 462.

Scirpus atropurpureus Willd. ex Kunth, l. c.

Eleocharis atropurpurea J. et C. Presl, 'Rel. Hænk. I. p. 196.'

Eleocharis setacea R. Br. l. c. p. 225, nec p. 224.

Roots fibrous. Stems cespitose, slender, striate, green, attaining about 26 cm. long; the inner sheath about 2-3 cm. long, brunneo-purple below, oblique at the orifice. Spikelets ovoid, globoso-ovoid, or ovoid-oblong, obtuse, fulvous, about 5-7 mm. long. Glumes numerous, densely imbricated, ovato-elliptical or obovato-elliptical, rounded at the apex, subscarios, ferruginous above, 1-nerved. Setae 7-8, retrorsely spinuloso-scabrous, unequal in length, the longer ones slightly exceeding the nut intermixed with shorter ones. Style exerted, bifid, with plumose branches, longer than the nut. Nut obovoid, compressed, smooth, nigro-castaneous, as long as $\frac{1}{2}$ -glume, $\frac{3}{4}$ mm. long; style-base small, depressed, pale.

Nom. Jap. *Tama-harii* (nov.).

Hab. ЛООНОО: Isl. Okinawa (*H. Kuroiwa!* herb. T. Makino).

Cyperus sanguinolentus Vahl, Enum. Pl. II. (1806) p. 351, **var. spectabilis** Makino.

Cyperus Eragrostis var. *spectabilis* Makino in Bot. Mag., Tokyo, VI. (1892) p. 47.

Umbel simple or subcompound; spikelets rather numerous, tufted, radiate, elongate, linear, very complanate, many-flowered, attaining 3 cm. long, 4 mm. broad.

Nom. Jap. *Shide-gayatsuri* (T. Makino).

Hab. Prov. TOSA: Ōsaki (T. Makino! Nov. 1884), Asakura (T. Makino!).

Probably a *lusus* form.

Cyperus Pseudo-Haspan Makino in Bot. Mag., Tokyo, VI. (1892) p. 47. = **Cyperus flavidus** Retz. Observ. Bot. V. (1789) p. 13.

Cyperus Haspan Rottb. Descr. et Ic. Pl. p. 36, tab. 6, fig. 2, non Linn. Attaining about 38 cm. in height. Umbel attaining 24 cm. across.

Nom. Jap. *Midzu-hanabi* (in Nagoya), *Hime-gayatsuri*.

Hab. Prov. TOSA: Takaoka-gōri (T. Makino! 1885), Sakawa (T. Makino! 1884, Sept. 12, 1887), Kasutani in Sakawa (T. Makino! Sept. 7, 1887), Kamo-mura (T. Makino! Sept. 21, 1887), Kambara (T. Makino! Oct. 17, 1892); Prov. IWASHIRO: Fukushima (K. Nemoto! Sept. 23, 1898); Prov. ECHIZEN (Herb. Sc. Coll. Imp. Univ. Tokyo, 1881); Prov. HITACHI: Atsuhata (J. Matsumura! herb. ibid. Aug. 1885); Prov. BITCHŪ: Hara-kosai in Takamatsu-mura (D. Nikai! herb. ibid. Oct. 10, 1902); Prov. KAI: Sashide (S. Gotō! herb. ibid. Sept. 11, 1904); Prov. OWARI: Near Ryūsenji-yama (C. Funabashi! 1905).

There are two forms of *C. Haspan* Linn. (Nom. Jap. *Ko-azegayatsuri*) in Japan. One (*var. micro-Haspan* m.) of the them, the estoloniferous and smaller-spiculose (achenes also smaller) form, very much resembles the present species, but the forms of glumes and achenes distinguish them both.

Fimbristylis fusca Clarke in Hook. fil. Fl. Brit. Ind. VI. p. 649 et in Journ. Linn. Soc. XXXIV. p. 71, XXXVI. p. 236.

Abildgaardia fusca Nees 'in Wight, Contrib. Bot. Ind. p. 95'; Boeck. in Linnaea, XXXVII. p. 54; Kunth, Enum. Pl. II. p. 249; Steud. Syn. Cyp. p. 72; Benth. Fl. Hongk. p. 390.

Iria fusca O. Kuntze, Rev. Gen. Pl. II. p. 753.

Gussonia pauciflora Brongn. 'in Bot. Duperr. Voy. (1829) p. 171, tab. 34 B.'

Abildgaardia pauciflora Kunth, l. c. p. 249.

Schœnus puberulus C. A. Mey. 'Cyp. Nov. p. 2, tab. 1'; Kunth, l. c. p. 337; Steud. Syn. Cyp. p. 166.

Rynchospora? anomala Steud. in Zoll. Syst. Verz. Ind. Archip. Pfl. I. p. 61, et Syn. Cyp. p. 149; Miq. Fl. Ind. Bat. III. p. 337.

Isolepis longispica Steud. Syn. Cyp. p. 104.

Fimbristylis Kamphœreneri Boeck. in Engl. Bot. Jahrb. V. (1884) p. 505.

Fimbristylis cinnamomectorum Hance in Journ. Linn. Soc. XIII. (1872) p. 132, non Kunth.

Fimbristylis steunantha Makino in herb. Sc. Coll. Imp. Univ. Tokyo.

Nom. Jap. *Noyama-tentsuki*, *Onoe-tentsuki*.

Hab. Prov. HYŪGA : Nishidake-mura (*R. Yatabe* and *J. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 5, 1882); Prov. TOSA : Suōgata (*T. Makino*! Oct. 1885), Shimomashino (*T. Makino*! Oct. 1885).

Carex shikokiana Makino in Bot. Mag., Tokyo, VI. (1892) p. 47, non Franch. et Sav. = **Carex Makinoensis** Franch. in Bull. Soc. Philomath. Paris, 8 Sér. VII. p. 47, et *Carex* As. Orient. p. 58; Léveillé et Vaniot in Bull. Acad. Intern. Géogr. Bot. XI. (1902) p. 107.

Nom. Jap. *Iwa-kansuge* (*T. Makino*).

Hab. Prov. TOSA (*T. Makino*!); Prov. IYO (*T. Makino*!).

Leersia japonica Makino in Bot. Mag., Tokyo, VI. (1892) p. 48. = **Leersia hexandra** Swartz, 'Prodr. Veg. Ind. Ōc. (1788) p. 21.'

Nom. Jap. *Ashikaki*.

Hab. Prov. TOSA (*T. Makino*!); Prov. MUSASHI (*T. Makino*!).

Not uncommon.

Allium fistulosum Linn. var. **cæspitosum** Makino var. nov.

Allium ascalonicum Savatier in Iinuma's Sōmoku-Dzūsetsu, ed. 2, VI. n. 33, non Linn.

Densely cæspitose, attaining about 40 cm. in height. Bulb, leaves, umbel (about 3 cm. across), and flowers smaller, but the form and colour as in the type. Bulbs many-aggregate. Spathe attaining about 2 cm. long.

Perianth: the outer about 5-6 mm. long; the inner longer and about 7 mm. or more long. Stamens about 11 mm. long.

Nom. Jap. *Wakegi*.

Icon. Sōmoku-Dzusesu, VI. fol. 34 recto.

Hab. Prov. MUSASHI: Near Ogikubo, cult. (*T. Makino!* May 14, 1905).

This is not found wild but cultivated, and is much less common than the type.

***Loxocalyx ambiguus* Makino, vide supra.**

Add. Hab. Prov. TOSA in Shikoku: Taniyai-yama in Zaisho-mura, Kami-gōri (*Zenkichi Kumon!* commun. T. Yoshinaga, Sept. 11, 1904).

New to the Isl. of Shikoku.

***Leonurus tuberiferus* Makino sp. nov.**

A small perennial, 4-30 cm. high, tuberiferous and stoloniferous; tuber solitary, subterranean, thick, oblong to ellipsoid, about 8-18 mm. long; roots fibrous; rhizome filiform, ascending or repent, with a few or several nodes, rooting; stolon filiform, subterranean, nodes distant and with minute scales. Stem erect, slender, usually laxly ramose, retrorse-spreadingly pubescent, 4-gonous with obtuse angles and plane faces as well as the branch; internodes shorter or longer than leaves; branches gracile, erect-patent or ascending. Leaves opposite, petiolate, pubescent on both sides and pilose on veins beneath, ciliated, oval-ovate, truncato-cuneate or sometimes truncato-cordate at the entire base, obtuse at the apex, regularly dentato-crenate, thinly membranaceous, about 1-3½ cm. long, 1-3 cm. wide; midrib delicate; veins about 3 on each side, very loose, subtripinerved at the base; veinlets inconspicuous; petiole gracile, pubescent with ascendingly patent hairs, shorter or longer than the blade, the longest one about 3 cm. long. Verticillasters axillary, loose, 1-3-flowered. Flowers erect or erect-patent, shorter than leaves; pedicel very short, pubescent, about ⅔-1 mm. long; bracts setaceous, pubescent, equal to or longer than the pedicel and situated at the base of it. Calyx obconically tubuloso-campanulate, obtuse at the base, pubescent with erect-patent few-celled hairs mixed with very minute granular glands externally and ciliated, thinly puberulent above internally, erect-patently 5-fid and somewhat 2-labiate, 7-10 mm. long; lobes shorter than the tube, deltoid-subulate, sharply spinescent-acuminate, 5-costate, with accessory veins between costas, very loosely reticulato-

venuled in the lobes. Corolla exserted, 2-labiate, densely piloso-pubescent (denser in the upper lip) mixed with thinly dispersed very minute granular glands externally, purple, 14–18 mm. long; posterior lip erect, as long as the tube, slightly galeate and sheltering the stamens, elliptical to oblong, retuse-rounded or emarginate, entire, ciliated, $7\frac{1}{2}$ –9 mm. long, 4–6 mm. wide; anterior lip horizontal and patent, about as long as the posterior one, 3-parted with close or subclose sinuses, glabrous on margin and on the inner surface, but slightly pubescent at the throat, 7–11 mm. broad; mid-lobe larger, lato-obcordate or very shortly produced at the apex, erose-crenulate above; lateral ones oval, rounded at the apex; tube exserted, narrowed and glabrous below, densely pubescent with ascending hairs in a broad ring at the infra-medium internally. Stamens shorter than the posterior lip of the corolla, erect, very slightly longer in the anterior pair, inserted at the throat, approximate; filament linear-filiform, softly pubescent; anther oblong-linear, cells much divaricate even reflexed, glabrous. Disk very short, subequal. Style equal to the stamens in height, filiform, glabrous, subunequally bifid into subulato-linear stigmatic branches, about 10–13 mm. long. Ovary-lobes oval-ellipsoid, rounded-obtuse and subglandular at the top, about $\frac{3}{4}$ mm. long. Nutlet (immature) oblong, attenuated below, truncate with angulate margin at the top, compressed-triquetrous, glabrous, smooth, with a short disk (gynophore), about 2 mm. long; disk slightly thicker towards the anterior.

Nom. Jap. *Hime-kisewata* (nov.).

Hab. Prov. SATSUMA: Shiroyama in Kagoshima (*Keisuke Tamura!* April 3, 1900); AMAMI-ŌSHIMA: Near Nase (*Keisuke Tamura!* March 26, and April 3, 1901).

Remarkable by having the tuber.

Campanula punctata Lam. **forma partita** Makino.

Corolla 5-parted or 5-cleft; lobes ovato-lanceolate, acute.

Hab. Prov. SHIMOTSUKE: Mt. Shirane in Nikkō (*T. Makino!* Aug. 1905).

Ilex leucoclada (Maxim.) Makino.

Ilex integra var. *leucoclada* Maxim. in Mém. Acad. Imp. Sc. St. Petersb. 7 Ser. XXIX. n. 3, p. 41.

A low shrub.

Nom. Jap. *Hime-mochi*.

Hab. Japan, northern, subalpine.

Lonicera strophiphora Franch. in Bull. Soc. Philomath. Paris, Sér. 7^e, X. p. 142 (1886); Rehder, Syn. Lonic. in Miss. Bot. Gard. (1903) p. 95.

Lonicera pilosa Maxim. in Mém. Biol. X. p. 73 (1877); Franch. et Sav. Enum. Pl. Jap. II. p. 653; Bretschn. Hist. Eur. Bot. Disc. Chin. p. 597, non Willd.

Lonicera Amherstii Dippel, Handb. Laubholz. I. (1889) p. 263, fig. 175, ex parte; Makino in Bot. Mag., Tokyo, XVII. p. 208.

Caprifolium Amherstii Kuntze, Rev. Gen. Pl. I. (1891) p. 274, ex parte.

Nom. Jap. *Ōba-hyōtamboku* (Y. Iinuma), *Arage-hyōtamboku* (K. Miyabe).

Hab. Japan, middle and northern, in mountains.

Achillea ptarmicoides Maxim. forma **brevidens** Makino.

Leaves: teeth shorter and much so in the superior leaves.

Hab. Prov. HIGO: Mt. Aso (*H. Kōdzuma!* July 23, 1905).

Juncus tenuis Willd. Sp. Pl. II. (1799) p. 214, et Enum. Pl. Hort. Bot. Berol. p. 392; Pers. Syn. Pl. I. p. 358; Spreng. Syst. Veg. II. p. 109; Hook. Fl. Bor.-Am. II. p. 191; Schult. Syst. Veg. VII. p. 231, et 1661 (excl. var. β - δ .); E. Mey. Junc. p. 14 (excl. β .), et in Linnæa, III. p. 371 (excl. var. β . et γ .); Kunth, Enum. Pl. III. p. 348; Griseb. Fl. Brit. W. Ind. Isl. p. 581; Koch, Syn. Fl. Germ. et Helv. ed. 3, p. 635; Ridley in Journ. Bot. (1885) p. 1, tab. 253; A. Gray, Man. Bot. ed. 5, p. 540; Wood, Class-B. Bot. p. 726; Benth. Handb. Brit. Fl. ed. 5, p. 471, et Illustr. ed. 5, n. 1067; Hook. fil. Stud. Fl. Brit. Isl. ed. 3, p. 416, et Fl. Brit. Ind. VI. p. 393; Buchen. in Engler's Bot. Jahrb. XII. (1890) p. 193; O. Kuntze, Rev. Gen. Pl. II. p. 725; Britt. et Br. Ill. Fl. N. Un. St. et Can. I. p. 386, fig. 922.

Juncus pallidus Willd. herb. ex Kunth, l. c.

Juncus bicornis Michx. Fl. Bor.-Am. I. p. 191.

Juncus gracilis Smith, 'Compend. Fl. Brit. p. 55'; Richeno in Trans. Linn. Soc. XII. p. 313.

Juncus Gesneri Smith; Spreng. l. c.; Schult. l. c. p. 232; Lindl. Syn. Brit. Fl. ed. 2, p. 274.

Juncus parviflorus Poir. Encycl. Suppl. III. p. 160.

Juncus macer S. F. Gray, 'Nat. Arrang. Brit. Pl. II. p. 164.'

Juncus chloroticus Schult. l. c. p. 240.

Juncus aristatus Link, 'Enum. Hort. Berol. I. p. 306.'

Juncus Smithii Kunth, l. c. p. 349.

Juncus lucidus Hochst 'in Seub. Fl. Azor. p. 24, tab. 4, f. 1.'

Juncus Germanorum Steud. Syn. Pl. Cyp. p. 305.

Juncus vacillans Steud. l. c.

Juncus compressus × *effusus* O. Kuntze, 'Taschen-flora v. Leipzig, p. 55.'

Perennial, green, attaining about 4 decim. high; rhizome very short, erect or ascending; roots dense, fibrous, filiform. Stems few to several-caespitose, very slender, wiry, subterete, striate, foliate at the base, scapiform. Leaves few, erect, narrowly linear, flat, but slightly involute when dry, densely minute-striate, attaining about 23 cm. long; sheath narrow, narrowly scarious towards the margin, 2-obtuso-auriculate at the top. Panicle terminal, compound, loose, subumbellate with erect or erect-patent unequal branches; branches and sometimes branchlets di- or trichotomous or subumbellate, or depauperate; floral leaves 2 or 3, similar to the common leaves in form and colour, the outer one exceeding the panicle and attaining about 13 cm. long; bract deltoid-subulate to narrowly deltoid-subulate; bracteoles minute, deltoid, acute or very acute, scarious, much shorter than the perianth. Flowers very shortly pedicellate, laxly arranged, lateral ones solitary or 2-5-unilateral. Perianth equal, erect-patent, narrowly subulato-lanceolate, acuminate, green and broadly scarious towards margins, 3-nerved, 3-3½ mm. long. Stamens 6, included; anther shorter than the filament. Style extremely short; stigmas 3, erect. Capsule trigonously lato-ellipsoid, equal to or slightly shorter than perianth in height, obtuse, minutely and shortly mucronate, triseptate, shining, yellowish-umber, 2-2½ mm. long; pericarp not thick. Seeds minute, numerous, obovato-oblong or ellipsoid, minutely albo-apiculate at both ends, yellowish-ferruginous, very subtilily transversely reticulated.

Nom. Jap. *Kusa-i*, *Shirane-i*.

Hab. Japan, without locality (*H. Nakanishiki!*); Prov. MUSASHI: Shimoshirane in Tsudzuki-gōri, spont. ! (*S. Takahashi!* June 6, 1903, Aug. 16, 1904), Tokyo, prob. introd. (*T. Makino!* June 27, 1893); Prov. SŪŌ: Ōuchimura in Yoshiki-gōri, prob. introd. (*H. Kōdzuma!* no. 221, Aug. 13, 1905).

New to the Flora of Japan; very rare.

Rosa yesoensis (Franch. et Sav.) Makino. = *R. rugosa* × *multiflora*.

Rosa Iwara β . *yessoensis* Franch. et Sav. Enum. Pl. Jap. II. p. 346.

Rosa matsuana Makino mss.

Rosa microphylla \times *rugosa* Crepin, ex Matsum. in Bot. Mag., Tokyo, X. (1896) p. 165.

Shrubby, attaining 2 m. or more high; branches glabrous or slightly glandular-hirsute, rather densely or rather loosely aculeate; aculei unequal, recurvo-patent, dilated at the base, narrow, very sharp, straight or somewhat falcate, yellowish, largest one about 9 mm. long. Leaves pinnate, 3-4-jugate, petiolate; petiole pubescent and very loosely armed with subuncinate aculei as well as the rachis; leaflets subclosely arranged, subobovately elliptical to oblong, obtuse to shortly acuminate, obtuse or obtusorounded at the base, simply or subduplicately serrate with very minutely subcallose-tipped triangular teeth, very narrowly revolute on margin, rather thinly pubescent beneath, glabrous and finely rugulose with impressed veins above, veins erect-patent and about 5-9 on each side; lateral ones sessile, patent, those of the lowest pair usually reflexed; odd one larger, attaining about 4 cm. long, $2\frac{1}{2}$ cm. broad; stipules membranaceous, ample, adnate, auriculate with triangular-falcate acuminate rather erect-patent lobes above, glanduloso-serrulate and ciliated on margin. Inflorescence corymbose, or shortly paniculate, about 1-8-flowered, sessile, bracteate; bract lato-ovate to lanceolate, tapering above, ciliated and glanduloso-fimbriato-errulate on margin, sessile, membranaceous. Flowers pedicellate, about $3\frac{1}{2}$ -4 cm. across, rose-purple; pedicel strict, longer or shorter than bracts, pubescent, lateral ones erect-patent. Calyx-lobes ovato-oblong or oblong, caudately long-attenuated above, entire or with a few linear laciniae on margin, patent or reflexed, lanate internally, sparsely glandular-pilose externally; the tube globose, glabrous, about 5 mm. long. Petals 5, patent, sessile, lato-obovate, emarginate. Stamens numerous, attaining about 7 mm. long. Styles dense, rather shortly exerted, lower than stamens, filiform, pubescent; stigma capitate; ovaries numerous, pilose.

Nom. Jap. *Ko-hamanasu* (Keisuke Itō).

Hab. HOKKAIDŌ (*L. Bœhmer!* herb. Sc. Coll. Imp. Univ. Tokyo, June 1874); Prov. MUTSU: Shirahama in Same-mura, Sannobe-gōri (*M. Koikawa!* 1905); *Y. Yamasaki!* June 1894), Sōzentai in Hashikami-mura, Sannobe-gōri (*M. Koikawa!* 1905).

The thinly aculeate form is more inclined towards *Rosa multiflora* Thunb.

Rosa multiflora Thunb. var. **Uchiyamana** Makino var. nov.

Rosa multiflora var. *fl. roseo* Makino in Bot. Mag., Tokyo, IX. (1895) p. 112.

Rosa moschata var.? Crepin, ex Matsum. in Bot. Mag., Tokyo, X. (1896) p. 166.

Shrubby, attaining about 2 m. or more in height, densely ramose, the main stem attaining about 8 cm. across at the base; branches slender, elongate, terete, glabrous, green but often shaded with purple when young, more or less flexuous, very loosely strongly armed with recurvo-patent or patent compressed subdeltoid sharp fulvous (but reddish when young) aculei. Leaves 2-3-jugate, petiolate, attaining about 10 cm. long, 8 cm. wide; leaflets loosely arranged, obovato-oval to obovato-lanceolate, or oblong-lanceolate, acuminate to obtuse, cuneately acute to obtuse or rounded-obtuse at the base, simply serrate with a mucronate point, green and very thinly puberulent but afterwards glabrate or glabrous above, subglaucous and puberulent but then nearly glabrate or glabrous beneath, chartaceous or membranaceous, often finely impressed in venation above; lateral ones very shortly petiolulate, spreading but those of the lowest pair often reflexed; odd one larger and rather long petiolulate, attaining about 5 cm. long, $1\frac{3}{4}$ cm. broad; rachis and petiole pubescent but then becoming thinly so or glabrous, often thinly glandular and very loosely reversely subuncinato-aculeate; stipules adnate, narrow, with linear-subulate free portions above, glanduloso-ciliato-subfimbriate; bracteoles minute and setiform. Inflorescence corymbose, short, 1-4-flowered; bracts ovato-lanceolate to oblong-lanceolate, long-acuminate, glanduloso-ciliated, thinly pubescent, usually shorter than pedicels, the lowest one usually all similar to the leaves; bracteoles opposite and placed at the base of the pedicel, minute, lato-linear to lanceolate, acuminate, glanduloso-ciliated, thinly pubescent, about 4-7 mm. long. Flowers rosy, about 4-4 $\frac{1}{2}$ cm. across, pedicellate; pedicels strict, thinly pubescent, or glabrous and glandular-pilose, attaining about 2 $\frac{1}{2}$ cm. long. Calyx-lobes reflexed, ovato-lanceolate to lanceolate, attenuato-acuminate, entire or with a few linear laciniae on margin, ciliated, sparsely glanduloso-hirsute dorsally, lanato-pubescent internally, about 10-12 mm. long; tube ellipsoid, very thinly pubescent, 4-5 mm. long. Petals 5, patent, cuneato-deltoid, emarginate often with a minute deltoid point in centre of the broad sinus, or subtruncate, sessile, about 1 $\frac{1}{2}$ -2 $\frac{1}{2}$ cm. long, 1 $\frac{1}{2}$ -2 cm. broad. Stamens numerous, spreading, attaining about 8 mm. long. Styles about 10-11, long-exserted, erect, filiform, piloso-pubescent, about 8 mm. long; stigma capitate; ovary lato-linear, densely hirsute. Fruit pedicellate, ovoid, smooth, glabrous.

naked from fallen calyx-lobes, red, with a fleshy wall, about 8–11 mm. long; achene few to several, ovoid-oblong, more or less compressed and angulate, pilose, about $5\frac{1}{2}$ mm. long.

Nom. Jap. *Kaidō-bara*.

Hab. Prov. MUSASHI: Chichibu (Herb. ! Sc. Coll. Imp. Univ. Tokyo), Mt. Bukō (*T. Makino* ! July 20, 1888), Tokyo, Bot. Gard. Koishikawa, cult. (Herb. ! Sc. Coll. Imp. Univ. Tokyo; *T. Makino* ! 1901, Dec. 4, 1905).

Larger than the type in every respect, and has much less flowered corymbose inflorescence and rosy petals. I have named this variety in memory of Mr. Tomijirō Uchiyama, the chief gardener of the Koishikawa Botanic Gardens, Science College, Imperial University of Tokyo.

Ligularia japonica (Thunb.) Less. Syn. Comp. p. 390; DC. Prodr. VI. p. 316; Miq. Prol. Fl. Jap. p. 112; Diels in Engl. Bot. Jahrb. XXIX. p. 622.

Arnica japonica Thunb. Fl. Jap. p. 319, et Ic. Pl. Jap. tab. 49; Willd. Sp. Pl. III. p. 2112; Pers. Syn. Pl. II. p. 454; Spreng. Syst. Veg. III. p. 567.

Senecio japonicus Schultz-Bip in Flora, XXVIII. (1845) p. 50; Maxim. in Mém. Biol. VIII. p. 14; Franch. et Sav. Enum. Pl. Jap. I. p. 248; Hance in Journ. Bot. (1882) p. 290; Franch. in Bull. Soc. Bot. France, XXXIX. (1892) p. 307; Matsum. Catal. Herb. Coll. Sc. Imp. Univ. Tokyo (1886). p. 106.

Erythrochete palmatifida Sieb. et Zucc. in Abh. Akad. Muench. IV. 3, p. 189.

Senecio japonicus forma dissecta Savat. in Iinuma's Sōmoku-Dzusetsu, ed. 2, XVII. n. 28.

Nom. Jap. *Hankwai-sō*.

Icon. Iinuma's Sōmoku-Dzusetsu, ed. 2, XVII. n. 28.

Hab. Japan, middle and southern, fields and hills.

var. β. Yoshizoeana Makino var. nov.

Senecio japonicus Savatier in Iinuma's Sōmoku-Dzusetsu, ed. 2, XVII. n. 27, non Schultz-Bip.

Leaves ovato-reniform or rotund-reniform, cordate at the base, palmatifid; lobes large, broad, ovato-elliptical, coarsely subinciso-dentate. Otherwise as in the type.

Nom. Jap. *Dake-buki*, *Chōryō-sō*.

Icon. Iinuma's Sōmoku-Dzusetsu, ed. 2, XVII. n. 27.

Hab. Prov. MUSASHI: Tokyo, Bot. Gard. Koishikawa, cult. (Herb. ! Sc. Coll. Imp. Univ. Tokyo, June 8, 1880).

This is much less common than the type. I have named it in memory of Mr. Shirō Yoshizoe, an officer of the Koishikawa Botanic Gardens, Science College, Imperial University of Tokyo.

var. *γ. clivorum* (Maxim.) Makino.

Ligularia clivorum Maxim. in Mém. Biol. VII. p. 555; Diels in Engl. Bot. Jahrb. XXIX. p. 622.

Senecio clivorum Maxim. in Mém. Biol. VIII. p. 14; Franch. et Sav. Enum. Pl. Jap. I. p. 247; Hemsl. in Journ. Linn. Soc. XXIII. p. 451; Franch. in Bull. Soc. Bot. France, XXXIX. (1892) p. 306; Henry in Gard. Chron. (1902) II. p. 217, cum tabula; Hook. fil. in Curtis's Bot. Mag. tab. 7902.

Senecio japonicus var. *integrifolius* Matsum. Catal. Herb. Coll. Sc. Imp. Univ. Tokyo (1886) p. 106.

Nom. Jap. *Maruba-dakebuki*, *Maruba-no-chōryōsō*.

Hab. Japan, middle and northern, mountains.

I do not think this more than a variety of *L. japonica* Less.

Ligularia Hodgsoni Hook. in Curtis's Bot. Mag. tab. 5417 (1863).

Nom. Jap. *Tōge-buki*, *Ezo-takarakō* (J. Matsumura), *Oni-takarakō* (nov.).

Hab. Prov. OSHIMA in Hokkaidō (*L. Bæhmer!* herb. Sc. Coll. Imp. Univ. Tokyo, June 1874; *K. Miyabe* and *Y. Tokubuchi!* herb. ibid. July 18, 1890), Hakodate (*R. Yatabe!* herb. ibid. Aug. 11, 1878; *K. Miyabe* and *Y. Tokubuchi!* herb. ibid. Aug. 6, 1890; *J. Matsumura!* herb. ibid. Aug. 15, 1899).

This seems to me to be very closely allied to *Ligularia calthefolia* Maxim., if not the same species.

Cacalia bulbifera Maxim. **var. *acerina*** Makino var. nov.

Leaves long-petiolate, orbiculato-reniform, unequally palmati-lobate, broadly truncato-subcordate and triangularly decurrent to the top of petioles at the base; lobes ovate, abruptly acuminate, entire or pauci-lentate.

Nom. Jap. *Momidzi-tamabuki* (nov.).

Hab. Prov. HIZEN: Mt. Tara (*Y. Kaneko!* Oct. 30, 1904).

Lactuca Thunbergii Maxim. **var. *angustifolia*** Makino var. nov.

Stem erect, attaining about 4 decim. high. Leaves long linear, acuminate, often gradually attenuated below, entire but usually patently loosely fimbriato-denticulate below, about 4 mm. wide but in the basal ones often broader and linear-spathulate. Panicle repeatedly branched, very numerous flowered. Heads smaller, 5-6-flowered. Involucral scales 5, linear or broadly linear, about 4 mm. long in flower but 5 mm. in fruit. Corolla 4- nearly 5 mm. long; ligule oblong, deeply 5-dentate with narrow teeth. Achene about 3 mm. long, linear-fusiform; pappus $2\frac{3}{4}$ mm. long.

Nom. Jap. *Hosoba-nigana* (nov.).

Hab. Prov. SHIMOOSA: Miyako-mura in Chiba-gōri (*K. Yamadzuta!* June 24, 1904, June 1905).

Cirsium inundatum Makino sp. nov.

Stem tall, erect, simple, glabrous, striato-sulcate when dry, foliate, often purple, attaining about $1\frac{1}{2}$ m. in height. Leaves sparse, erect-patent, sessile, auriculato-amplexical or semi-amplexical at the base, obscurely serrato-dentate to pinnatiparted, elliptical to oblong-lanceolate but gradually angustate in the superior ones, acuminate, ciliato-spiculose on margins; lobes spreading, spiculate at the apex, 3-6 on each side, deltoid (in the pinnatilobed one), or subulato-lanceolate to lanceolate with a few lobules below and elongate in the terminal lobe (in the pinnatiparted one). Heads erect, but turned laterally in the lateral ones, a few to subnumerous, corymbosely disposed, approximate, with erect peduncles, solitary on the long peduncle or few-subaggregate with short or very short pedicels; bracteoles small, angustato-linear, usually exceeding the pedicel. Involucre campanulate, rounded at the base; involucral scales narrowly subulato-linear, aculeato-acuminate, ciliated on margin, convex dorsally, erect or ascending, subglabrous or thinly arachnoid, subrigid, the exterior ones about $\frac{1}{3}$ as long as the internal ones, viridescent but purple above in the internal ones. Florets numerous, purple; corolla about 18-21 mm. long, longer than pappus; lobes equal to the throat and $\frac{1}{2}$ as long as the filiform tube. Pappus about 14 mm. long, avellaneous. Ovary about $2\frac{1}{2}$ -4mm. long, lato-linear.

Nom. Jap. *Tachi-azami* (nov.).

Hab. Prov. IWASHIRO: Aidzu (*J. Matsumura!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1879), Mt. Iide (*J. Matsumura!* herb. ibid. Aug. 13, 1879), Mt. Baudai (*G. Nakahara!* herb. ibid. Aug. 26, 1904); Prov. ETCHŪ: Yao (*R. Kitasawa!* Sept. 1903); Prov. SHINANO: Idzuna-hara and Togakushi-hara (*T. Makino!* Aug. 1904).

Cirsium yezoense (Maxim.) Makino.

Cnicus yezoensis Maxim. in Mél. Biol. IX. p. 328 (1874); Franch. et Sav. Enum. Pl. Jap. I. p. 261.

Nom. Jap. *Saiwa-azami* (Sōmoku-Dzusetsu, XV. n. 41).

Hab. Prov. SHINANO: Fudōsawa in Mt. Togakushi (*T. Makino!* Aug. 1904); Prov. ERCHŪ: Otosawa-mura (*M. Yūki!* Oct. 5, 1904).

Cirsium nipponicum (Maxim.) Makino.

Cnicus nipponicus Maxim. in Mél. Biol. IX. p. 311 (1874); Franch. et Sav. Enum. Pl. Jap. I. p. 258.

Nom. Jap. *Hime-azami* (Sōmoku-Dzusetsu, XV. n. 40)?; *Nambu-azami* (K. Miyabe).

Hab. Prov. RIKUCHŪ: Mt. Iwate (*G. Nakahara!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1, 1903), Near Miyamori (*T. Makino!* Aug. 1905).

Cirsium Buergeri Miq. Prol. Fl. Jap. p. 117.

Cnicus Buergeri Maxim. in Mél. Biol. IX. p. 319; Franch. et Sav. Enum. Pl. Jap. I. p. 260.

Nom. Jap. *Hime-yamaazami* (nov.).

Hab. Prov. YAMASHIRO: Mt. Hiei (*T. Makino!* Sept. 1905.); Prov. ŌMI: Mt. Ibuki (*T. Makino!* Sept. 29, 1905).

Cirsium pectinellum A. Gray, Bot. Jap. p. 395.

Cnicus pectinellus Maxim. in Mél. Biol. IX. p. 308 (1874); Franch. et Sav. Enum. Pl. Jap. I. p. 258.

Nom. Jap. *Ezo-no-sawaazami* (nov.).

Hab. Prov. OSHIMA: Hakodate (*R. Yatabe!* herb. Sc. Coll. Imp. Univ. Tokyo, July 21, 1878); Prov. KITAMI: Nctoro (*K. Miyabe!* herb. *ibid.* July 14, 1884); Prov. ISHIKARI: Sorachibuto in Sorachi (*K. Miyabe!* herb. *ibid.* Aug. 8, 1891).

ADDENDA AND CORRIGENDA.

- Page 11, line 4, *before* "in Linnæa" *insert*: et
— 38, — 2, *before* "Hook." *add*: Lehm. in
— " — 3, *before* "DC." *add*: Ser. in
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— 43, — 11, *for* "p, 139" *read*: p. 183
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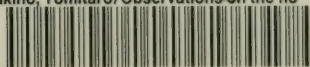
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