Observations on the Flora of Japan.

(Continued from p. 88.)

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Ipomœa Batatas (Linn.) Poir.

a. Batatas Makino.

Convolvulus Batatas Linn. Sp. Pl. p. 154, et Amœn. Acad. VI. p. 121; Richt. Cod. n. 1229; Houtt. Linn. Pfl.-Syst. V. (1779) p. 527; Willd. Sp. Pl. I. p. 853, et Enum. Pl. Hort. Berol. I. p. 204; Pers. Syn. Pl. I. p. 178; Roxb. Fl. Ind. I. p. 483; Ait. Hort. Kew. ed. 2, I. p. 331; Michx. Fl. Bor.-Am. I. p. 138; Blume, Bijdr. p. 712; Lour. Fl. Cochinch. ed. Willd. p. 131; Spreng. Syst. Veg. I. p. 607; Nutt. Gen. N. Am. Pl. I. p. 123.

Ipomœa Batatas Poir. in Lam. Encycl. VI. p. 14; Meisn. 'in Mart. Fl. Brasil. VII. p. 282'; Rœm. et Schult. Syst. Veg. IV. p. 218; Griseb. Fl. Brit. W. Ind. p. 468 (*a.*, *β. leucorrhiza*, *γ. porphyrorhiza*); Hemsl. Bot. in Cent.-Am. II. p. 384; Clarke in Hook. fil. Fl. Brit. Ind. IV. p. 202; A. Gray, Syn. Fl. N. Am. II. 1, p. 211; F. v. Muell. Sel. Ext.-Trop. Pl. (1885) p. 185; Hillebr. Fl. Hawai. Isl. p. 314; Sincl. Indig. Fl. Hawai. Isl. tab. 15; Peter in Engl. et Prantl, Nat. Pfl.-Fam. IV. 3 a, p. 30; Diels in Engler's Bot. Jahrb. XXIX. p. 544; Henry, List Pl. Formos. p. 63; Hiern, Cat. Afr. Pl. Dicotyl. (1898) p. 736.

Ipomœa Batatas Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Genoot. XII. p. 35, ex parte, non Poir.

Ipomœa Batatas a. edulis Kuntze, Rev. Gen. Pl. II. p. 442, excl. syn. *Convolvulus edulis* Thunb.

Batatas edulis Choisy, Conv. Or. (1833) p. 53, et in DC. Prodr. IX. p. 339; Miq. Fl. Ind. Bat. II. p. 599; Zolling. Syst. Verz. Ind. Archip. p. 128; Seem. Fl. Vit. p. 170; Drury, Usef. Pl. Ind. ed. 2, p. 72; Lowe, Fl. Madeil. II. p. 51 (*a. cordifolia*,

β. digitata); Wood, Cl.-Book Bot. p. 571; Debeaux, Fl. Shangh. p. 96, et Fl. Tchef. p. 239, obs., non *Convolvulus edulis* Thunb.

Batatas edulis Sieb. et Zucc. in Abhandl. Acad. Muench. IV. 3, p. 148; Miq. Prol. Fl. Jap. p. 25; Franch. et Sav. Enum. Pl. Jap. I. p. 330, observ., pro parte, non Choisy.

Batatas edulis β. xanthorrhiza Choisy in DC. Prodr. IX. p. 338.

Batatas edulis γ. platanifolia Choisy, l. c. p. 339.

Convolvulus esculentus Salisb. 'Prodr. p. 123'; Spreng. Syst. Veg. I. p. 607.

Ipomœa Catesbæi G. F. W. Mey. 'Prim. Fl. Esseq. p. 113.'

Batatas xanthorrhiza Bojer, 'Hort. Maurit. p. 225.'

Convolvulus septangularis Steud. 'Nom. ed. 2, I. p. 411.'

Convolvulus tuberifer Steud. l. c. p. 412.

Nom. Jap. *Amerika-imo*, *Benri-imo*.

Hab. Japan, cultivated.

This is cultivated in the southern parts of this country. The leaves and tuberous roots differ from those of the next variety.

β. edulis (Thunb.) Makino.

Convolvulus edulis Thunb. Fl. Jap. (1784) p. 84; Willd. Sp. Pl. I. p. 875; Pers. Syn. Pl. I. p. 182; Spreng. Syst. Veg. I. p. 607; Rœm. et Schult. Syst. Veg. IV. p. 286.

Ipomœa edulis Makino in Iinuma' Sōmoku-Dzusetsu, ed. 3, I. 4 (1907) p. 33, tab. 25.

Batatas edulis Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 3, p. 148; Miq. Prol. Fl. Jap. p. 25; Franch. et Sav. Enum. Pl. Jap. I. p. 330, observ., pro parte, non Choisy.

Ipomœa Batatas Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Genoot. XII. p. 35, pro parte, non Poir.

Convolvulus fastigiatus Roxb. Fl. Ind. I. p. 468; Rœm. et Schult. Syst. Veg. IV. p. 302.

Ipomœa fastigiata Sweet, 'Hort. Brit. ed. 1, p. 288, et ed. 2, p. 372'; Meisn. 'in Mart. Fl. Brasil. VII. p. 267'; Griseb. Fl. Brit. W. Ind. p. 468 (*α.*, *β. platanifolia*); Hemsl. Bot. in Biol. Cent.-Am. II. p. 387; Miq. Fl. Ind. Bat. II. p. 616;

Choisy in DC. Prodr. IX. p. 380 ; Clarke in Hook. fil. Fl. Brit. Ind. IV. p. 209 ; Forbes et Hemsl. in Journ. Linn. Soc. XXVI. p. 159 ; Peter in Engl. et Prantl, Nat. Pfl.-Fam. IV, 3 a, p. 30 ; Diels in Engler's Bot. Jahrb. XXIX. p. 544.

Ipomœa Batatas var. *fastigiata* Kuntze, Rev. Gen. Pl. II. p. 442.

Convolvulus platanifolius Vahl, 'Symb. Bot. III. p. 26' ; Willd. Sp. Pl. I. p. 850.

Ipomœa platanifolia Roem. et Schult. Syst. Veg. IV. p. 220.

Convolvulus roseus Mill. 'Gard. Dict. ed. 8, n. 18' ; Roem. et Schult. Syst. Veg. IV. p. 300.

Convolvulus essequibensis Spreng. Syst. Veg. I. p. 600.

Ipomœa cymosa G. F. W. Mey. 'Prim. Fl. Esseq. p. 99.'

Ipomœa pandurata G. F. W. Mey. l. c. p. 100.

Ipomœa stenocolpa Garcke in Linnaea, XXII. (1849) p. 67.

Ipomœa alba Garcke, l. c.

Nom. Jap. *Satsuma-imo*, *Kara-imo*.

Hab. Japan, widely cultivated.

Convolvulus edulis Thunb. was hitherto considered as synonym of *Ipomœa Batatas* (Linn.) Poir., but it should be identified with *I. fastigiata* (Roxb.) Sweet.

***Calystegia hederacea* Wall. var. *pentapetala* Makino.**

Corolla deeply 5-parted ; lobes angustate, acuminate, few-dentate.

Nom. Jap. *Fugire-hirugao*.

Icon. Iinuma's Sōmoku-Dzusetsu, ed. 2, IV. n. 24.

Hab. Japan, cultivated.

***Aster Maackii* Regel, Tent. Fl. Ussur. n. 252.**

Aster Kodzumanus Makino in Bot. Mag., Tokyo, XXI. (1907) p. 16.

Nom. Jap. *Higo-shion*.

Hab. Prov. Higo (*H. Kōdzuma*!).

Euonymus alatus (Thunb.) Sieb. Syn. Pl. Oecon. Jap. in Verh. Batav. Genoot. XII. (1830) p. 49, n. 268.

var. striatus (Thunb.) Makino.

Celastrus striatus Thunb. Fl. Jap. (1784) p. 98; Willd. Sp. Pl. I. p. 1126; Pers. Syn. Pl. I. p. 242; Rœm. et Schult. Syst. Veg. V. p. 419; DC. Prodr. II. p. 6; Franch. et Sav. Enum. Pl. Jap. I. p. 80, et II. p. 314.

Euonymus subtriflorus Blume, Bijdr. p. 1147 (1826); Sieb. et Zucc. in Abhandl. Akad. Muench. IV. 2, p. 151.

Euonymus alatus β . *subtriflorus* Franch. et Sav. Enum. Pl. Jap. II. p. 311; Maxim. in Mél. Biol. XI, p. 196.

Euonymus alatus β . *apterus* Regel, Tent. Fl. Ussur. p. 41, tab. 7, fig. 2-3.

Nom. Jap. *Ko-mayumi*.

Hab. Japan.

Celastrus articulatus Thunb. **var. punctatus** (Thunb.) Makino.

Celastrus punctatus Thunb. Fl. Jap. (1784) p. 97; Blume, Bijdr. p. 1145; Spreng. Syst. Veg. I. p. 775; Rœm. et Schult. Syst. Veg. V. p. 419; DC. Prodr. II. p. 6; Miq. Prol. Fl. Jap. p. 17; Franch. et Sav. Enum. Pl. Jap. I. p. 80.

Celastrus striatus ? Miq. Prol. Fl. Jap. p. 142.

Celastrus articulatus β . Maxim. in Mél. Biol. XI. p. 201.

Celastrus kiusianus Franch. et Sav. Enum. Pl. Jap. II. p. 314.

Scandent; branches elongate, slender, glabrous, terete, many-striato-angulate when dried, ferruginous, dispersed with white lenticels; branchlets patent, foliose. Leaves petiolate, elliptical, oblong-elliptical, or obovato-elliptical, shortly produced with an obtuse tip at the apex, acute at the base, depressed-crenate with incurved and callosomucronate teeth, narrowly revolute on margin, coriaceous, glabrous, green and shining above in recent, paler beneath, 3-7 cm. long, $1\frac{1}{2}$ - $4\frac{1}{8}$ cm. broad; veins 4-5 on each side, impressed above in recent but more or less elevated when dried; petiole 3-14 mm. long. Capsule globose, glabrous, pedicelled, 1-2 to a cyme which is much shorter than leaves. Seeds yellow-arillate.

Nom. Jap. *Teriha-tsuruumemodoki*.

Hab. Prov. Hizen (*T. Makino* ! Aug. 1907).

This variety in living condition differs evidently from the type (*C. articulatus* Thunb.) by having the shining and impressed-veined leaves, although the dried specimens cannot readily be distinguished from it.

Arisæma heterophyllum Blume, Rumphia, I. p. 110 ; Kunth, Enum. Pl. III. p. 20 ; Schott, Prodr. Syst. Aroid. p. 55 ; N. E. Brown in Journ. Linn. Soc. XVIII. p. 250, et XXXVI. p. 178 ; Makino in Bot. Mag., Tokyo, XI. (1897) p. 33, et XV. (1901) p. 134.

Nom. Jap. *Maidzuru-tennanshō*.

Hab. Prov. Higo in Kiusiu (*K. Ikeda* ! 1906).

Distrib. China and Corea.

Polygonatum ibukiense Makino.

Polygonatum Periballanthus var. *ibukiense* Makino in Bot. Mag., Tokyo, XII. (1898) p. 229, et XV. (1901) p. 151.

Polygonatum nipponicum Makino, l. c. XVII. (1903) p. 51.

Nom. Jap. *Ibuki-waniguchi*.

Icon. Inuma's Sōmoku-Dzusetsu, ed. 2, VI. n. 4.

Hab. Prov. ŌMI : Mt. Ibuki (*Y. Kawasaki* ! 1906).

Cryptogramme Stelleri (Gmel.) Prantl in Engler's Bot. Jahrb. III. p. 413 ; Diels in Engl. et Prantl, Nat. Pfl.-Fam. I. p. 280.

Pteris Stelleri Gmel. 'Nov. Comment. Acad. Petrop. XII. p. 519, tab. 12, fig. 1 (1768).'

Allosorus Stelleri Rupr. 'in Beitr. Pflanzenk. Russ. III. p. 48' ; Ledeb. Fl. Ross. IV. p. 526 ; Moore, Ind. Fil. p. 46 ; Bedd. Ferns Brit. Ind. tab. 73 ; Kuntze, Rev. Gen. Pl. II. p. 805.

Pellæa Stelleri Baker, Syn. Fil. ed. 1 (1868) p. 453 ; Sm. Ferns Brit. et For. ed. 2 (1896) p. 309 ; Watt, 'Can. Fil. n. 2' ; Bedd. Ferns Brit. Ind. et Ceyl. (1883) p. 100, fig. 51 ; Britt.

et Br. Ill. Fl. N. Un. St. et Can. I. p. 29. fig. 1 ; Christ, Farnkr. d. Erde, p. 157.

Allosorus sitchensis var. *Stelleri* Milde, Fil. Eur. et Atl. As. Min. et Sibir. (1867) p. 26.

Pteris gracilis Michx. Fl. Bor.-Am. II. p. 262 ; Swartz, Syn. Fil. p. 99 ; Willd. Sp. Pl. V. p. 376 ; Hook. Fl. Bor.-Am. II. p. 264 ; Wood, Cl.-Book Bot. p. 819.

Allosorus gracilis Presl, Tent. Pteridogr. p. 153 ; Kunze in Linnæa, XXIII. p. 219 ; A. Gray, Man. Bot. p. 264, et ed. 2, p. 591, tab. 9 ; Metten. Fil. Hort. Lips. p. 44.

Cheilanthes gracilis Kaulf. Enum. Fil. p. 209 ; Spreng. Syst. Veg. IV. p. 115.

Pellæa gracilis Hook. Sp. Fil. II. (1858) p. 138, tab. 133 B ; Hook. et Baker, Syn. Fil. p. 145 ; Eaton, Ferns N. Am. II. (1880) p. 65, tab. 54, fig. 8-10 ; Eaton in A. Gray, Man. Bot. ed. 5, p. 659, tab. 15 ; Clarke, Ferns N. Ind. in Trans. Linn. Soc. Ser. 2, I. p. 460.

Cryptogramme gracilis Torrey, ex Kunze, l. c. p. 219.

Pteris minuta Turcz. 'Cat. Baik.-Dah. n. 1346.'

Allosorus minutus Turcz. 'ex Trautv. Imag. Pl. Fl. Russ. p. 9, tab. 3.

Nom. Jap. *Yatsugatake-shinobu* (nov.).

Hab. Prov. SHINANO : Mt. Yatsugatake (*T. Makino* ! Aug. 1907).

New to the Flora of Japan.

***Sanguisorba hakusanensis* Makino, sp. nov.**

Perennial, about 2-3 m. in height, glabrous. Stem erect, robust, very laxly leafy, often loosely branched above, or sometimes simple, exceeding the radical leaves. Radical leaves long-petiolate, about 11-13-foliolate ; cauline leaves smaller, about 5-11-foliolate ; leaflets shortly petiolulate, elliptical to oblong, cordate to obtuse at the base, obtuse to emarginate to the apex, attaining about 9 cm. long, 4 cm. wide, obtuse or acutish-serrate ; rachis pubescent at the nodes in front. Spikes cylindrical, cernuous, about 8 cm. long ; rachis tomentoso-pubescent ; bracts ovato-elliptical to oblong-lanceolate, ob-

tuse or acutish, 1-nerved, pubescent dorsally and ciliated as are bracteoles, longer than the ovary, $2\frac{1}{2}$ –3 mm. long; bracteoles 2, shorter than the bract, deltoid or ovato-deltoid, acute. Flowers centrifugally expanded, numerous, dense, rose-purple, sessile, about 7 mm. across. Calyx-lobes patent, obtuse and callosomucronate at the apex, 3-nerved towards the centre, puberulent below externally; the outer 2 somewhat narrower, oval to elliptical; the inner 2 orbiculate; the tube ovato-oval, compressed, 4-angled, puberulent above, about $1\frac{3}{8}$ mm. long. Disk inconspicuous. Stamens 9–11, long-exserted, 3-times as long as calyx-lobes, about 10 mm. long; filament filiform, gradually dilated and flattened upwards, suddenly short-attenuated at the apex; anther rounded, nearly 1 mm. long, dark-purple. Style much shorter than filaments, hardly longer than calyx-lobes, filiform; stigma subcapitate, fimbriate. Ovary included, oval, compressed, glabrous. Fruit: calyx-tube about 2 mm. long, oval, compressed, 4-angled, glabrous but puberulent at the apex.

Nom. Jap. *Karaito-sō*.

Hab. Prov. KAGA: Mt. Hakusan (*R. Yatabe* and *J. Matsu-mura*! herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 8, 1881); Prov. SHINANO: Mt. Shirouma (*Y. Yabe*! herb. *ibid.* Aug. 25, 1902).

This species has a close resemblance to *S. obtusa* Maxim., but the number of stamens and the colour of anther will distinguish them.

***Sanguisorba grandiflora* Makino, sp. nov.**

Sanguisorba tenuifolia β . *grandiflora* Maxim. Prim. Fl. Amur. p. 94?

Perennial, about 2–3 decim. or more high. Rhizome thick, oblique, covered with old bases of petioles, rufous. Radical leaves several, ascending, 11–19-foliolate, about 9–16 cm. or more long including the petiole, which is short or long (about 2–7 cm. long) and often crispate rufo-pubescent below with a vaginate purple base; cauline leaves much smaller and a few in number with a few leaflets; leaflets extremely petiolulate but sessile in the superior ones, sometimes minutely stipellate, ovate to oblong, acutish to subcordate at the base, obtuse or acute,

acutely serrate, attaining about 3 cm. long, $1\frac{2}{3}$ cm. wide, glabrous; rachis slender, pubescent at nodes in front. Stem erect, glabrous but thinly paleaceo-pubescent with rufous crispate hairs towards the base, exceeding the radical leaves, sparingly branched above, each branch monostachyus. Spike erect, cylindrical, crass, about 2–5 cm. long, $1\frac{1}{5}$ – $1\frac{1}{3}$ cm. across; rachis pubescent; bract lato-linear or spathulato-linear, attenuated above with an obtuse tip, carinate, arcuato-subgeniculate, thickly membranaceous, purplish-rufous, pubescent, shorter than the flowers and about 3–5 mm. long; bracteoles subulate, ovato-subulate, or subulato-lanceolate, shortly acuminate, pubescent, $1\frac{1}{2}$ –2 mm. long. Flowers centrifugally expanded, numerous, dense, sessile, about 5 mm. in diameter, greenish-white or purplish above. Calyx-lobes patent, often reflexed at the apex, 4 but often 5–6, thickish towards the obtuse tip, obscurely carinate dorsally, $2\frac{1}{2}$ –3 mm. long, ovato-oblong to ovato-orbicular, puberulent below externally; tube oval, puberulent above, compressed, 4-angled, $1\frac{1}{2}$ –2 mm. long, but in fruit alato-orbiculate and attaining about $3\frac{2}{3}$ mm. in width. Disk small, hemispherical. Stamens 4, but abnormally 5–6, exserted, about one-half longer than the calyx-lobes, 4–5 mm. long; filament gradually dilated and flattened upwards, shortly attenuated at the apex, narrower than the anther; anther rounded, dark-purple, with oblong cells. Style shorter than the calyx-lobes, filiform; stigma capitato-fimbriate. Ovary included, elliptical, compressed; placenta hairy. Achene ovato-elliptical, compressed, about $2\frac{1}{3}$ mm. long.

Nom. Jap. *Chishima-waremokō* (nov.).

Hab. Prov. CHISHIMA (Kurile): Isl. Shimushu (*K. Yendō!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 18, 1903; *S. Amatsu!* herb. ibid. Aug. 1904).

This differs from *S. obtusa* Maxim. by the shorter stamens and dark-purple anthers, and from *S. tenuifolia* Fisch. by the form of bracts, not having truncate filaments, thicker and shorter spike, and broader leaflets.

(*To be continued.*)