Observations on the Flora of Japan.

(Continued from p. 246.)

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Fragaria nipponica Makino, sp. nov. in Bot. Mag., Tokyo, XXV. (1911), p. 229, Miscel. (Fig. XX.)

Fragaria elatior Maxim. in litt.; Matsum. Shokubutsu Mei-i (1895), p. 127, p. 1364, et Ind. Pl. Jap. II. 2 (1912), p. 202, non. Ehrh.

Fragaria elatior Maxim. in Bull. Soc. Nat. Mosc. (1879), p. 17 quoad pl. Jap.

Fragaria vesca ? Franch. et Sav. Enum. Pl. Jap. I. (1875), p. 129, non Linn.

Fragaria vesca Auct. Jap. non Linn.

Fragaria collina Franch. et Sav. l. c. II. (1879), p. 336, non Ehrh.

Leaflets petiolulate. Pedicel with erect-patent hairs throughout; bracteoles linear to oblong-lanceolate. Flowers hermaphrodite. Petals orbiculate. Carpophore ellipsoid, oblong, or oval, the base naked from carpels. Achenes imbedded in pits on surface of the carpophore.

Perennial, attaining about 25 cm. in height, stoloniferous after anthesis; stolons few, at length very long, filiform, thinly patently pubescent, radicant in nodes, often rubicund; internodes elongate. Rhizome short or elongate, oblique or repent, often curved, with a terminal tuft of leaves, rooting, thickish, ligneous, covered with old bay stipules above. Leaves few to subnumerous, ternate, long-petiolate, thinly pubescent with

adpressed hairs above, piloso-pubescent with adpressed sericeous hairs on veins and midrib beneath, ciliated, coarsely and regularly sharp-serrate with broad-ovate and mucronato-acute teeth, rounded in outline at the apex, entire and broadly cuneate at the base, membranaceous, plicate; veins several to subnumerous on each side, parallel, regularly arranged, straight or subarcuate upwards, each reaching to the apex of serratures; terminal leaflet slightly larger, shortly petiolulate, oval-ovate or oval-obovate to oblong-elliptical, 1–4 $\frac{2}{3}$ cm. long, $\frac{3}{4}$ –2 $\frac{4}{5}$ cm. wide in flower, but attaining 5 $\frac{1}{2}$ cm. long and 3 $\frac{1}{3}$ cm. wide in fruit; lateral leaflets very shortly petiolulate, erect-patent, somewhat oblique at the base, ovato-oval or obovato-oval to elliptical; petiole about 1 $\frac{1}{2}$ –19 cm. long in flower, slender, pubescent with often patent or sometimes subreflexed hairs, and hairs sometimes erect-patent towards the base; stipule scarious, adnate below, 1–2 cm. long, entire on margin, the free portion subulate to ovato-subulate, cuspidato-acute to subsetaceo-acuminate at the apex, thinly piloso-pubescent on the midrib dorsally and hairs dense at the top, very loosely veined. Flowering stems including the cyme exserted, or sometimes nearly equalling the leaves in height, few, elongate, slender, patently piloso-pubescent; cauline leaf in the base of cyme, ternate to simple, smaller or much so than the radical ones, shortly petiolate, stipulate, sharply serrate and piloso-pubescent as in the radical leaves, sometimes reduced into only subulate stipules, in the compound cyme 2nd. one present and usually stipuliform. Cyme laxly 1–4-flowered, simple or compound. Flowers white, hermaphrodite, long-pedicellate, upward, about 16–18 mm. across; pedicel filiform, pubescent with erect-patent hairs, about 1 $\frac{1}{2}$ –3 $\frac{2}{3}$ cm. long in flower; bracts minute, above or below the middle, often opposite, linear to subulate, erect-patent or subadpressed, pubescent; bracteoles shorter or rarely longer than the calyx-lobes, linear or broad-linear, rarely oblong-linear or oblong-lanceolate, acute or acuminate, rarely bifid or biparted, entire, herbaceous, green, thinly adpressed-pubescent, ciliated. Calyx adpressed-pubescent externally; tube depressed, shorter than lobes, densely pubescent under the gynophore internally; lobes 5, patent,

ovato-subulate, subcaudata-acuminate, entire or sometimes minutely 1-2-serrulate, herbaceous, deep green externally, paler but yellowish-viridescent at base internally, 4-6 mm. long, persistent; midrib slightly prominent and veins loosely reticulated. Petals 5, sometimes 6, orbiculate, about 7-8 mm. long and wide, yellowish at the base, deciduous; veins flabellate below and veinlets densely anastomosing above. Stamens subnumerous, much shorter than petals, unequal in length, erect or erect-patent, glabrous, attaining about 4 mm. long; filament subulate, pale; anther ovato-elliptical, obtuse at apex, shortly bifid at base, yellow. Ovary-cluster about 3 mm. long and across, ovoid-spherical, yellowish; ovaries many, dense, minute, sessile, ovoid, obtuse, compressed laterally, glabrous, $\frac{2}{3}$ mm. long; style ventral, erect, exserted, arcuate outwards above, terete, glabrous; stigma terminal, truncate. Gynophore erect, oblong-cylindrical, obtuse at top, straight, very shortly naked from ovaries at the base, thinly piloso-pubescent, about $2\frac{1}{2}$ mm. long. Carpophore nutant, with persistent reflexo-patent or adpressed green calyx (concave at base) and persistent filaments at the base, oblong, ellipsoid, or oval, rounded at both ends, 8-15 mm. long, 7-10 mm. across, uneven with deep pits and very thinly hairy on

FIG. XX. *mag.*

surface, carpeliferous except only the base, at first pale then red, succulent, delicious. Achenes minute, numerous, dispersed, sitting at the bottom of deep pits of the carpophore, ovoid, oblique in form, obtuse at apex, slightly compressed laterally, sessile, smooth and slightly nervate, glabrous, slightly carinate dorsally, $1\frac{1}{5}$ – $1\frac{1}{3}$ mm. long; carpel crustaceous.

Nom. Jap. *Shiobana-no-hebiichigo*.

Hab. Japan, central and northern, alpine mountains.

This is very closely allied to *Fragaria vesca* Linn., but the latter is to be distinguished from our present species by the sessile leaflets, appressed-hairy pedicel, ovate bracteoles, obovate petals, obovoid or globose carpophore, and superficial achenes. The present species also differs from *F. elatior* Ehrh., which has the sub-unisexual flowers. Except the condition of hairiness, this has a resemblance to *F. canadensis* Michx. of North America. *F. vesca* Linn. has hitherto not been found in Japan.

montr. pinnata (Takeda) Makino.

Fragaria vesca *montr. pinnata* Takeda in Bot. Mag., Tokyo, XXIV. (1910), p. 314.

Hab. Prov. SHIMOTSUKE: Mt. Nikkô (*Y. Chiba*! May 26, 1907).

Fragaria Hayatai Makino, sp. nov. (Fig. XXI.)

Fragaria vesca var. *minor* Hayata ex Kawakami, List Pl. Formos. (1910), p. 33, n. 465; Hayata, Mater. Fl. Formos. (1911), p. 97, et Icon. Pl. Formos. I. (1911), p. 236.

Fragaria sp. Hayata, Fl. Mont. Formos (1908), p. 82.

Leaflets petiolulate; terminal tooth especially smaller and shorter. Pedicel with patently villosio-subtomentose hairs throughout; bracteoles trifid. Flowers hermaphrodite. Petals distant, broadly obovate or obcordate, subunguiculate. Style angustately fusiform, cellular (of one layer) and subhyaline surrounding the centre.

Perennial, stoloniferous after anthesis; stolons few, very long, filiform, patently villosio-pubescent. Rhizome rather short, erect or ascending, ligneous, nigrescent, rooting below,

covered with old bay stipules above, simple or few-ramose, with a terminal tuft of several leaves. Radical leaves dense or rather so, long-petiotate, ternate; leaflets small, broadly sub-rhomboid-ovate, subemarginate (terminal tooth smaller and shorter) in outline at apex, entire and broadly cuneate at base, regularly sharp-serrate with sub-falcately ovato-deltoid erect-patent teeth, adpressed-pilose and plicato-impressed-nervate above, adpressed-villosopubescent with sericeous hairs and prominent-nervate beneath (hairs especially denser on veins and midrib), ciliated, thickly membranaceous, very shortly petiolulate; veins

FIG. XXI.

several to few on each side, erect-patent, parallel, straight or somewhat arcuate upwards, simple or few-branched; terminal leaflet slightly larger, 7–23 mm. long, 6–21 mm. wide; lateral leaflets very oblique at base being acute on the superior side and rounded on the inferior, erect-patent, 6–19 mm. long, 4–16 mm. wide; petiolules patently or erect-patently or refractedly sericeo-villososubtomentose, $\frac{1}{2}$ –2 mm. long in the terminal leaflets, but shorter in the lateral leaflets; petiole about $\frac{2}{3}$ –6 cm. long in flower, then attaining about 9 cm. long, angustate, patently

sericeo-villose-subtomentose and hairs more dense in young ones; stipules about 4–13 mm. long, scarious, entire on margin, adnate below, free portion ovato-elliptical or ovato-deltoid, cuspidate or setaceous-obtuse or acute at apex, adpressed-pilose on the midrib dorsally and ciliated. Flowering stem including the cyme somewhat exserted or not, solitary, angustate, patently villose-subtomentose with sericeous hairs, foliiferous or aphyllous; cauline leaf at the base of cyme small, with cuneato-obovate leaflets, shortly petiolate, lanceolately stipulate; bract very small, simple, oblong to linear, entire and few-serrate towards the apex, shortly petiolulate, stipulate at the base. Cyme longer or shorter than the stem, one to laxly few flowered. Flower white, about 9–14 mm. in diameter, long-pedicellate, upward; pedicel bractless, $1\frac{1}{3}$ –4 cm. long, gracile, patently villose-subtomentose with sericeous hairs; bracteoles 5, as long as the calyx-lobes, green, densely villose-subtomentose as well as the calyx dorsally, thinly adpressed-pubescent internally, ciliated, cuneato-ovate, acuminate, 3-fid, rarely oblong or narrowly oblong and entire or bifid, copiously anastomotic-venuled, persistent. Calyx light green; tube depressed, shorter than the lobes, pubescent internally; lobes 5, patent, elliptical or oblong, sometimes oblong-lanceolate, entire, and cuspidate, or 3-fid with sharp-pointed lobules (mid-lobule larger), rarely 2-fid, ciliated, pubescent above dorsally, closely and copiously anastomotic-venuled, about 5 mm. long, $2\frac{1}{2}$ mm. broad. Petals 5, patent, distant each other, a little exceeding the calyx-lobes in length, obovato-orbicular, retuso-rounded and shortly cuspidate or emarginate at apex, broadly cuneate below and contractedly subunguiculate at base, 4–6 mm. long, $2\frac{2}{3}$ –5 mm. wide, delicately nervate; veins 3–5 at base then ramose, reticulated-venuled above. Stamens subnumerous, not exceeding or sometimes scarcely so the ovary-cluster, unequal in length, glabrous, attaining about $2\frac{1}{2}$ mm. long; filament subulate; anther ovato-oval or ovato-orbicular, rounded or retuse at apex, subcordate at base, flat, with a broad connective; anther-cells linear, arcuate. Ovary-cluster globose, sessile, densely carpeliferous, about 4 mm. across; gynophore ovoid-globose, thinly pubes-

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FIG. XXII.

cent. Ovaries very numerous, minute, ellipsoid, obtuse at apex, compressed laterally, glabrous, smooth, $\frac{3}{8}$ mm. long; style much exserted, ventral, erect and straight in the superior ones but ascending and arcuate in the inferior, twice as long as the ovary, angustately fusiform, subhyaline and cellular (one layer) with transverse delicate septa (cell-walls) surrounding the centre; stigma simple, not thick, obtuse. Carpophore small, about 6 mm. across, nutant, globose, sessile, thinly pubescent; dispersedly carpeliferous but naked at the base, succulent, delicious, with adpressed persistent calyx at base. Achenes sessile, ovoid, obtuse at apex, slightly compressed laterally, oblique in form, smooth, glabrous, 1 mm. long, slightly imbedded in shallow pits of carpophore. Flowers in March.

Nom. Jap. *Shima-shirohebiichigo* (Island Fragaria).

Hab. FORMOSA: Mt. Ganzan (*S. Nagasawa*! Oct. 30, 1905), Mt. Niitaka (*T. Kawakami* and *B. Hayata*! Oct. 19, 1906), Mt. Tozan (*G. Nakahara*! Nov. 1906), Mt. Ekitaizan (*B. Hayata*! Aug. 9. 1908), Mt. Centr. (*Ushinosuke Mori*! March 1910).

A good species, and the only representative of this genus in Formosa. It is quite distinct from *Fragaria vesca* Linn.

Lilium Miquelianum Makino in Inuma's Sômoku-Dzsetsu, ed. 3, I. (1907), p. 432, et in Bot. Mag., Tokyo, XXIV. (1910), p. 301; Grove, Lil. p. 110. (Fig. XXII.)

Lilium medeoloides Miq. Prol. Fl. Jap. in Ann. Mus. Bot. Lugd.-Bat. III. (1867), p. 156; Baker in Journ. Linn. Soc. XIV. p. 236 (1874), pro parte; Elwes, Monogr. Lil. (1880), tab. 35 sinistr., non A. Gray.

Nom. Jap. *Chôsen-kasayuri* (Corea Wheel Lily).

Hab. Japan, rarely cultivated.

This lily is not native of Japan. *Lilium medeoloides* A. Gray, Bot. Jap. in Mem. Am. Acad. Art. a. Sc. n. s. VI. (1859), p. 415; Franch. et Sav. Enum. Pl. Jap. II. p. 63, excl. Miq. Prol. 320, is same species with *L. avenaceum* Fisch. bearing the nutant flowers and the Japanese name of *Kuruma-yuri* (Wheel

Lily), from which our species is evidently different as shown by the accompanied figure.

Ehippianthus Schmidtii Reichb. fil. in Flora (1868), p. 33; Fr. Schmidt, Reis. im Amur. u. Ins. Sachal. (1868), p. 221, tab. 5, fig. 1-7; Takeda in Bot. Mag., Tokyo, XXIV. (1910), p. 133.

Liparis Schmidtii Benth. in Journ. Linn. Soc. XVII. p. 294.

Ehippianthus sachalinensis Reichb. fil. ex Fr. Schmidt, l. c. p. 180; Franch. et Sav. Enum. Pl. Jap. II. p. 510.

Nom. Jap. *Ko-ichiyôran*.

Hab. Prov. TOSA in Shikoku: Mt. Shiraga in Nagaoka-gôri (*Torama Yoshinaga*! Aug. 30, 1907).

Above-quoted locality may be the southern limit of this species.

Clematis ovatifolia Ito ex Maxim. in Mél. Biol. XII. p. 415; Makino in Bot. Mag., Tokyo, XXIV. (1910), p. 245.

Stem terete, substriate, glabrous, green. Leaves opposite, green and shining above, paler beneath, those of basal sterile ones angustate and albo-variegate along the midrib or along, the midrib and veins; rachis terete, green; petiolules terete green, narrowly grooved in front above; nodes of petiolules slightly prominent; petiole dilated at base, flatly subgrooved in front, green.

Hab. Prov. KII (*N. Ui*! Nov. 1910).

(*To be continued.*)