Observations on the Flora of Japan.

(Continued from p. 150.)

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Plagiogyria stenoptera (Hance) Diels in Engl. et Prantl, Nat. Pfl.-Fam. I. 4, (1899), p. 282 ; Matsum. et Hayat. Enum. Pl. Formos. p. 615.

Blechnum stenopterum Hance in Journ. Bot. (1883), p. 268.

Lomaria stenoptera Baker in Ann. Bot. V. (1890-91), p. 220 ; Henry, List Pl. Formos. p. 111.

Lomaria concinna Baker in Journ. Bot. (1885), p. 103, et in Hook. Icon. Pl. XVII. (1886) tab. 1644.

Plagiogyria Matsumureana Hayata in Bot. Mag., Tokyo, XXIII. (1909), p. 32, pro parte, non Makino.

Plagiogyria auriculifera Makino in herb.

Rhizome thick, ascending, densely rooting ; roots black, not stout. Stipes shorter than the frond, 4-quetrous and 4-alate, plane in back, compresso-triquetrous and slightly dilated at the base, glabrous, dull viridescent above, castaneo-nigrescent below, about 7-17 cm. long. Frond erect-patent but spreading above, very deeply pinnati-parted, quite green, glabrous, membranaceous, subpellucid, not firm, oblong-lanceolate or broadly lanceolate, subabruptly caudato-acuminate, contracted below, 30-50 cm. rarely 60 cm. long, 8-15 cm. rarely 20 cm. broad ; rachis prominent throughout but carinate above beneath ; segments numerous, patent-divergent but patent below, approximate with narrow sinuses, subdilated and very slightly contiguous to next one, narrowly lanceolate, acuminate but often acute or obtuse in the lower ones, serrulate towards the apex, the inferior few to sub-many (about 2-14) ones deformed, very diminished in size and auriculiform, more or less distantly disposed, the

middle ones largest and 4–8 cm. rarely $11\frac{1}{2}$ cm. long, 8–13 mm. rarely 15 mm. broad; midrib more or less prominent on both sides; veins delicate but distinct beneath, patulous, simple or bifurcate, the venule sometimes again bifurcate. Fertile fronds as long as the sterile fronds, erect; stipe and rachis slender; pinnæ many, loosely disposed, often secund, shortly stipitate, angustato-linear, acuminate, patent or erect-patent, but sometimes more or less reflexed in the lower ones, dark-green, the inferior pinnæ sterile and very diminished in size, deformed and auriculiform. Sori orange-yellow; spore yellow.

Nom. Jap. *Shima-yamasotetsu* (nov.).

Hab. Prov. ŌSUMI: Yaku-shima (*T. Makino*! Sept. 1909); FORMOSA: Daironkōsha in Taitō (*T. Kawakami* and *U. Mori*! herb. Sc. Coll. Imp. Univ. Tokyo, Nov. 30, 1906, no. 2357), Tozan on Mt. Morrison (*G. Nakahara*! herb. ibid. Dec. 1906).

***Plagiogyria Hayatana* Makino, sp. nov.**

Plagiogyria Matsumureana Hayata in Bot. Mag., Tokyo. XXI. (1907), p. 14, et Fl. Mont. Formos. in Journ. Coll. Sc. Imp. Univ. Tokyo, XXV. Art. 19 (1908), p. 244, non Makino, excl. syn.

Plagiogyria Matsumureana Hayata in Bot. Mag., Tokyo, XXIII. (1909), p. 32, pro parte, non Makino.

Rhizome erect, or ascending. Stipes triquetrous, exalate, shorter than the frond, about 12–20 cm. long, the base depressed-triquetrous and more or less dilated. Frond glabrous, more or less firm, oblong or narrowly oblong, acuminate, very deeply pinnati-parted, 30–50 cm. long, 12–17 mm. broad; segments numerous, close but sometimes subremote, patent or patent-divergent, but usually somewhat reflexed in the basal ones, linear-lanceolate, subfalcate, acuminate, slightly dilated at the base, serrulated (the serration more conspicuous towards the apex), attaining about 9 cm. long, 1 cm. broad; midrib prominent on both sides; veins patent-divergent, bifurcate and sometimes the venule again bifurcate, simple in the superior ones; rachis carinate throughout beneath. Fertile fronds exceeding the sterile ones, long-stiped; pinnæ remotely and simple-pinnately dis-

posed, not secund, a little dilated and adnate at the base, angustate, patent or erect-patent, the lower ones often reflexed.

Nom. Jap. *Taiwan-yamasotetsu* (nov.).

Hab. FORMOSA: Rakurakusha (*G. Nakahara!* herb. Sc. Coll. Imp. Univ. Tokyo, Aug. 1905, no 458), Mushazan in Nantō (*T. Kawakami* and *U. Mori!* herb. ibid. Aug. 10, 1906, no. 2402), Ekitaizan (*T. Kawakami* and *U. Mori!* herb. ibid. Aug. 9, 1908).

ANALYTICAL KEY TO JAPANESE PLAGIOGYRIA.

- 1 { Frond discolorous, niveo-farinose
beneath.....*P. glauca* Mett.
- 2 { Frond concolorous, green. 2.
Sterile pinnæ petiolulate.....*P. euphlebia* Mett.
- 3 { Sterile pinnæ sessile or adnate. 3.
Sterile pinnæ sessile below and ad-
nate above.....*P. adnata* Bedd.
- 4 { Sterile pinnæ all broadly adnate. 4.
Fertile pinnæ stipitate, the lower ones
deformed and auriculiform.....*P. stenoptera* Diels.
- 5 { Fertile pinnæ adnate, the lower ones
also normal. 5.
Back of the rachis flat.....*P. Matsumureana* Makino.
- 5 { Back of the rachis carinate.....*P. Hayatana* Makino.

***Monachosorum nipponicum* Makino, sp. nov.**

A fern nigricant when dried, thinly dispersed with very minute fulvous furfuraceous scales, about 36 cm. long. Rhizome short, ascending and often curved, epaleaceous, rooting; roots filiform, with short branches, ferrugineo-nigrescent. Stipes cæspitose, slender, shorter than the frond, ferruginous below but nigrescent at the basal portion, about 12–17 cm. long. Frond deltoid-lanceolate, acuminate, membranaceous, tripinnatifid or subtripinnate, about 17–23 cm. long, 8–10 cm. broad; rachis slender, apterous, longitudinally bi-marginate in front; pinnæ sessile or nearly so, opposite or alternate, patent or patent-divergent, subapproximate, many,

lanceolate or ovato-lanceolate, acuminate or acute, attaining ; about $7\frac{1}{2}$ cm. long, 3 cm. wide ; pinnules many, sessile, subapproximate, ovato-lanceolate or ovate, acute at the apex, cuneate at the base, pinnatifid, or pinnatiparted, or subpinnate ; segments few to several on each side, erect-patent, elliptical or oblong and often subfalcate, acute or obtuse, entire or bi-tri-fid or crenato-sub serrate, the upper basal one somewhat larger and oblong ; vein flexuous ; venules loose, erect-patent, one to a tooth, soon stopping before reaching the tip. Sori numerous, minute, rounded, convex, destitute of indusium, terminating the top of venules.

Nom. Jap. *Kishū-shida* (nov.).

Hab. Prov. KII : Yomura in Higashi-muro-gōri (N. Ui ! March 30, 1909, no. 34).

Athyrium Nakanoi Makino, sp. nov.

A small fern, about 14–39 cm. long. Rhizome erect or oblique, numerousely rooting, covered with old base of stipes. Stipes tufted, slender, loosely scaly and purpurascens (in recent) below, about 3–13 cm. long ; scales subulato-lanceolate, mostly entire, densely venulose, fulvous. Frond simply pinnate, angustato-lanceolate, acuminate, membranaceous, nearly glabrous, dull green, 11–26 cm. long, $2\frac{1}{4}$ – $3\frac{1}{2}$ cm. wide ; rachis very slender, puberulent ; pinnæ many, patulous, very shortly petiolate, oblong, obtuse, cuneate at the lower base, auriculate and truncate at the upper base, sublobulato-crenate ; midrib more or less arcuate upwards ; veins free and pinnate, erect-patent, usually bifurcate but simple in the few superior ones, that in the auricle simple-pinnately venulose. Sori 2–serial, each series midway between the midrib and margin, dorsal, short, mainly athyroid and often hypopocrepiform ; indusium thinly membranaceous, eroso-dentate on margin. Sporangia shortly stalked.

Nom. Jap. *Hime-hōbishida* (nov.).

Hab. Prov. ŌSUMI : Yaku-shima (T. Makino ! Sept. 1909).

This fern grows in shady places of mountains. I have named the species in honour of Mr. Yoyemon Nakano, who discovered it in botanizing with me in the above mentioned locality.

Blechnum nipponicum (Kunze) Makino in Bot. Mag., Tokyo, XI. (1897) p. 82.

Lomaria nipponica Kunze, Pterid. Jap. in Bot. Zeit. VI. p. 508; Miq. Prol. Fl. Jap. p. 336; Franch. et Sav. Enum. Pl. Jap. II. p. 215.

Lomaria Spicant β . *japonica* Hook. Sp. Fil. III. p. 16.

Lomaria Spicant auct. non Desv.

Blechnum Spicant A. Gray, Bot. Jap. p. 421, non Roth.

Nom. Jap. *Shishi-gashira*.

Hab. Japan.

Common. This differs evidently from *Blechnum Spicant* (Linn.) Roth, which is also found on mountains of the northern Japan.

Polypodium Engleri Luer. in Engler's Bot. Jahrb. IV. p. 361; Makino, Phanerog. et Pterid. Jap. Ic. I. tab. 29.

Polypodium hastatum var. *Engleri* Makino in sched. herb. Sc. Coll. Imp. Univ. Tokyo.

var. **yakushimense** Makino, var. nov.

Smaller. Rhizome repent, loosely ramose, covered with fulvous peltato-subulate and long-acuminate scales. Stipe gracile, 2–8½ cm. long. Frond lanceolate or narrow-lanceolate, attenuatedly acuminate or obtuse at the apex, attenuated at the base, thinner, repand-crenate and when dried often slightly crispate on margin, 3–9 cm. long, ½–14 mm. broad; midrib dark above; veins erect-patent, delicate but distinct. Sori midway between the midrib and margin, or slightly nearer to the midrib, elevated upon the upper surface.

Nom. Jap. *Hime-takanohauraboshi* (nov).

Hab. Prov. ŌSUMI: Yaku-shima (*T. Makino!* Sept. 1909).

This is much smaller than the type, and resembles the simple form of *Polypodium hastatum* Thunb. It is found growing abundantly on rocks on side by mountain rivulets.

Euonymus yakushimensis Makino, sp. nov.

A shrub, deciduous. Trunk and branches viridescent, terete,

glabrous, smooth; branchlets erect-patent or patulous; bud narrowly conical, tapering. Leaves opposite, shortly petiolate, lanceolate, oblong-lanceolate, or ovato-lanceolate, often somewhat falcate, long-acuminate, acute at the base, crenulate, quite glabrous, green above, light green beneath, membranaceous, 4–13 cm. long, $1\frac{1}{2}$ –4 cm. broad; midrib and veins prominent beneath, veins about 5–8 on each side, erect-patent, slightly arcuate upwards; petiole glabrous, 3–5 mm. long. Cyme umbellate, several-flowered, long-peduncled; peduncle filiform, glabrous, 4–9 $\frac{1}{2}$ cm. long in fruit. Flowers pedicellate, 4–merous; pedicel gracile, glabrous, purpurascent, 16–23 mm. long in fruit. Sepals semiorbicular, membranaceous, concave, entire, veined, purple, glabrous, persistent, about 2 mm. long. Petals orbiculate, 5 mm. broad. Stamens short; filament very short, subulate. Capsules pendulous, 1–3 to a peduncle, globose and then dehiscent, exangulate, smooth, glabrous, light green, 4–carpellary, hardly 4–sulcate vertically, about 9–10 mm. across. Seeds 1–2 in each cell, elliptical-oblong, compressed, fulvous, slightly minutely rugose longitudinally; aril red, entirely inclosed the seed; embryo within the albumen and nearly as long as it; cotyledons flat, oblong; cauricle much shorter than the cotyledons.

Nom. Jap. *Ao-tsuribana* (nov.).

Hab. Prov. Osumi; Yaku-shima, mountains (*T. Makino* ! Sept. 1909.).

This species comes near to *Euonymus melananthus* Franch. et Sav., but the stem and leaves are much larger; it has the habit of *E. oxyphyllus* Miq. The green trunk and branches give to it a peculiar appearance.

Cissus japonica (Thunb.) Willd. Sp. Pl. I. p. 659.

Vitis japonica Thunb. Fl. Jap. p. 104.

var. dentata Makino, var. nov.

Leaves thinner; leaflets subunequally dentate with cuspidate deltoid teeth.

Nom. Jap. *Hiragi-yabugarashi* (nov.).

Hab. Prov. SATSUMA : Near Kagoshima (*T. Makino* ! Sept. 1909).

Ainsliæa linearis Makino, sp. nov.

Perennial, attaining about 33 cm. in height, solitary to few-tufted. Rhizome short, rooting. Stem erect, terete, lanate above, dark-green. Leaves sparse but densely placed and subtufted towards the top of the stem, linear, mucronato-acute, gradually attenuated to the long petiole at the base, depressed-crenate with a setose tip, attaining about $1\frac{1}{2}$ –6 cm. long, 3–7 mm. broad; midrib slender; veins loose, delicate; petiole gracile, shorter than the blade, canaliculate in front, very narrowly alate on margins, shortly dilated at the base. Panicle spiciform, slender, erect, much exceeding the crowded leaves, the lower branches often more or less longish; rachis slender, bracts and bracteoles minute, deltoid-subulate, acute, the upper bracteoles passing the involucreal scales. Capitulum small, shortly pedicellate, triflorous. Involucre linear-cylindrical, 6–9 mm. long, glabrous; scales imbricated, green and pale-scarious on margin, usually purpurascens towards the tip, mucronato-obtuse, few-nerved, the lower ones broadly ovate, the middle ones ovate to ovato-lanceolate or oblong-lanceolate, the upper ones linear-lanceolate, and the uppermost one lato-linear. Receptacle glabrous. Floret about 5–10 mm. long. Corolla white; limb 5-cleft, the inner sinus deeply cut-down; lobes slightly declinate towards the outer side, erect-patent, reflexed above, lato-linear, subacute; tube shorter than the limb. Stamens lower than the corolla; anther cylindrical; connective erect, rectangular, truncate; cell with a long straight tail. Style glabrous; arms short, rectangular, truncate. Pappus shorter than the corolla, isabel-coloured, thinly pilose and minutely spinulose. Ovary obovato-cylindrical, densely hispid with white adpressed hairs, $1\frac{1}{2}$ –2 mm. long.

Nom. Jap. *Hosoba-haguma* (nov.).

Hab. Prov. ŌSUMI : Yaku-shima (*T. Makino* ! Sept. 1909).

This species grows on rocks on side by mountain rivulets.

The capitulum and florets are similar to those of *Ainsliæa apiculata* Schult-Bip.

Viburnum Carlesii Hemsl. in Journ. Linn. Soc. XXIII. p. 350 ; Bean in Gard. Chron. (1906), I. p. 306 ; Hemsl. in Curtis's Bot. Mag. tab. 8114 (1907).

Viburnum bitchiuense Makino in Bot. Mag., Tokyo, XVI. (1902), p. 156, reprint. p. 70.

Nom. Jap. *Chōji-gamazumi*, *Bitchū-gamazumi*.

Hab. Prov. BITCHŪ : Kawanose in Hongō-mura (*Z. Yoshino* ! June and Aug. 28, 1902 ; May 12, 1903), Taniai in Kusamura (*T. Akagi* ! comm. *Z. Yoshino*, April 25, 1906, floriferous) ; Prov. TSUSHIMA (*S. Hara* ! ; *Z. Tashiro* !).

Rhododendron indicum (Linn.) Sweet, Brit. Fl. Gard. Ser. 2, tab. 128.

var. mikawanum Makino, var. nov.

A shrub, deciduous. Leaves shortly petioled, oblong-elliptical, obovato-elliptical, obovato-oblong, or oblanceolate, mucronato-acute or obtuse at the apex, cuneato-acute at the base, attaining about $3\frac{1}{2}$ cm. long, $1\frac{1}{2}$ cm. broad, thinly hirtellous. Flower purple !

Nom. Jap. *Murasaki-yamatsutsuji* (nov.).

Hab. Prov. MIKAWA : Takashi-mura (*T. Makino* ! Oct. 25, 1893).

Corydalis incisa (Thunb.) Pers. Syn. Pl. II. p. 269.

forma pallescens Makino.

Flowers pallescent, often slightly purpurascens partly.

Nom. Jap. *Shiro-yabukeman* (nov.).

Hab. Prov. MUSASHI : Adzusawa (*T. Makino* !).

Bœhmeria nivea (Linn.) Hook. et Arn. Bot. Voy. Beech p. 214.

var. concolor Makino, var. nov.

Stem often woody, ramose. Leaves usually smaller and

narrower, concolorous and green, or sometimes slightly hoary beneath.

Nom. Jap. *Kusa-mao*.

Hab. Prov. YAMASHIRO: Takao (*T. Makino*! Nov. 7, 1893); Prov. HARIMA: Mt. Masui (*K. Ikeda*! 1902).

***Gentiana yakushimensis* Makino, sp. nov.**

Perennial, caespitose, glabrous, attaining about 20 cm. in height. Stem simple, foliose throughout, erect or ascending. Leaves 4-verticillate, dense, linear, obtuse, smooth on the entire margin, thickish, with short petioles which are connate at the base, longer than the internodes, attaining 22 mm. long and 4 mm. broad, the lower ones smaller and often shorter than the internodes; midrib visible but veins inconspicuous. Flower solitary, terminal, sessile, erect, about $4\frac{1}{3}$ cm. long, cæruleo-purple. Calyx about $1\frac{1}{2}$ cm. long; tube obconico campanulate, scarioso-membranaceous; lobes 8, shorter than the tube, remote each other, erect or nearly so, linear-oblong, obtuse, unequal in size, herbaceous, green; sinuses truncate in bottom. Corolla tubuloso-campanulate, 6-8-fid, minutely virid-punctate in throat, oval-ovate, acute, about 7-8 mm. long; dlicæ shorter than the lobes, deltoid-subulate, bifid into linear-subulate lobules. Stamens 6-8, included, about 16 mm. long; filament subulate; anther linear, 8 mm. long. Pistil slightly exceeding the stamens; ovary linear-oblong, stipitate; style short; stigma simple, revolute. Capsule shortly stipitate, ncluded within the corolla, narrowly oblong, compressed. Seeds minute, copious, linear-fusiform, with a long subulato-filiform tail at the apex, about $3\frac{1}{2}$ mm. long including the tail.

Nom. Jap. *Yakushima-rindō* (nov.).

Hab. Prov. ŌSUMI: Summit of Mt. Miyanouradake in Yakushima (*Y. Kudo*! communicat. *T. Uchiyama*; *T. Makino*! Sept. 1909.).

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