Plantæ Japonenses novæ vel minus cognitæ.

(Continued from p. 32.)

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Hymenophyllum oligosorum Makino sp. nov.

Rhizome horizontally wide-creeping, setaceous, fuscous-brown, with loosely fibrous roots; scales piliform, nearly adpressed, crispate, 2-celled, light leather-coloured, but ferruginous when dry, denser towards the young apical tip of the rhizome, and thinly dispersed on the young stipes, rachis and nerves of the frond beneath. Stipes filiform, laxly placed on the rhizome, much shorter than the frond, upper half very narrowly alate, about $\frac{1}{2}$ —2cm long. Frond dilute green, but olivaceous or brownish-olivaceous when dry, oval to oval-oblong, rounded at the apex, but abrupted in the soriferous ones, usually truncato-subcordate at the base, rather firm in texture, naked but furnished with thinly hair-scales on the rachis and nerves underneath as above described, $1\frac{1}{2}$ —4cm or more long, 1—2 $\frac{1}{2}$ cm broad; pinnae 3 to 9 on each side, closely placed, spreading, sessile, ovate, obtuse, obliquely and broadly cuneate at the base and confluent to the rachis-wing to which the upper lower side is parallel, very slightly crispate, deeply pinnatifid into a few simple or bifurcate segments; segments erect-patent, close-placed, oblong, $1\frac{1}{2}$ —2mm broad, rounded-obtuse at the apex, nearly entire on margin but very obscurely and very minutely denticulate, one-nerved; main rachis broadly winged, flexuous, fuscous; secondary rachis also flexuous; veinlets loose, erect-patent, green in living specimens. Sori 2—10, terminal, and often lateral on the superior pinna, approximate, almost rounded, $1\frac{1}{2}$ —2 $\frac{1}{2}$ mm each way, rounded at the base; involucre orbicular, erose and sometimes subtruncate on front margin, naked, divided down to the base into 2-valves; sporangia numerous, clustered in capitate manner on the top of a short receptacular column, included, shortly pedicellate, with reddish and incomplete ring.

Nom. Jap. *Kiyosumi-kokeshinobu* (T. Makino nom. nov.)

Hab. Prov. AWA (=BōSHU): Mt. Kiyosumi-yama (Herb.! Sc. Coll. Imp. Univ. Tokyo, June 10, 1882; *T. Makino*! April 6, 1896, April 1898).

A rare species not yet known from other localities, and found in the above locality much densely growing on the basal portion of the trunk of large trees.

***Hymenophyllum flexile* Makino sp. nov.**

Rhizome wiry, wide-creeping, laxly branched, darkish-brown, nearly naked, rooting. Stipes loosely placed on the rhizome, slenderly elongate, wiry, hard, naked but margined with narrowly crispate wings on both sides except the lower portion, shorter than the frond, 2—9cm in length. Frond lanceolate, or broadly lanceolate, sometimes ovate-lanceolate, shortly subacuminate, 8—25cm long, 3—5½cm broad, tripinnatifid or subquadripinnatifid, thin, flexible, naked, but thinly and very minutely scaly on the rachis and nerves beneath, darkish ferruginous-brown when dry; pinnæ usually erect-patent, 10—14 on each side, moderately closed, or laxly distant in the superior and inferior, narrowly triangular-rhomboidal, or sometimes rhomboidal-deltoid, often somewhat falcate, broadly cuneate at the base, very shortly petioled or nearly sessile, divided down nearly to the rachis into few or several pinnules on each side, lowest ones decreasing in size, largest ones about 5cm long, nearly 2cm broad; pinnules cuneate-ovate, deeply divided into few simple or bifurcate segments in the lower ones, but upper ones only bifurcate or simple; ultimate segments narrowly oblong, entire, obtuse or retuse at the apex, 1½—2mm broad; main rachis slender, crispato-winged throughout, each lateral wing 1 to 1½ mm in width. Sori rather copious, laxly disposed except the apical and lower portions of frond, 1 to 15 to a pinna, terminating the inner lower segments of the pinnules, rounded or broadly rounded, rounded at the base, 1½—2½mm each way; involucre divided down to very base, naked; valves orbicular, sometimes truncate in front, crose-dentate on front margin; sporangia numerous, clustered in capitate manner on the top of a short receptacular column, included, very shortly pedicellate, with incomplete ring.

Nom. Jap. *Ō-kokeshinobu*.

Hab. Prov. KII: Mt. Nachiyama (*Z. Matsumura*! herb. Sc. Coll. Imp. Univ. Tokyo, July 25, 1883; *M. Miyoshi*! herb. l. c. Aug. 18, 1887); Prov. TOSA: Near Mt. Tebako-yama (*T. Makino*! Aug. 1885), Mt. Hōnokawa-yama (*T. Makino*! Aug. 10, 1887), Mt. Kurotaki-yama (*T. Makino*! Nov. 1892).

This species is found in the south-west part of Japan, growing pendent on the trunks of trees or the surface of rocks in shady places. It is distinguished from *H. javanicum* Spreng., principally by the form of the frond, and its manner of sustaining the numerous sporangia on the receptacular column.

Trichomanes thysanostomum Makino Contr. Stud. Fl. Jap. in Bot. Mag., Tokyo, XII, 1898, p. 193.

Caudex very short, erect, with dense scales at the crown; scales fibrillose, fuscous-black, one-costate, $1\frac{1}{2}$ — $2\frac{1}{2}$ mm long; roots dense, hard, wiry, black, nigro-tomentose, with short rootlets. Stipes tufted, several in number, shorter than the frond, ascending, elongate, terete, strong, hard, dark, hairy at the base, dispersed with very minute glandular adpressed hairs and then nearly naked, with extremely narrowed marginal-line on both sides, 6—16 cm long. Frond quadripinnatifid or more decompose, narrowly ovate, 10—28 cm long, 4—15 cm broad, rigid in texture, deeply olivaceous-green when dry, scattered with minute adpressed glandular scaly hairs on rachis and nerves beneath; pinnæ alternate, erect-patent, 6—10 on each side, moderately close-placed, ovate-lanceolate, attenuate above, with numerous pinnules, very shortly petioled, with very narrowly winged and filiform rachis, largest ones about 12 cm in length; pinnules erect-patent, triangular-rhomboidal, cuneate at the base, very shortly petiolulate, or sessile, cut down to the very narrowly winged filiform rachis into several segments; segments deeply pinnatifid into a few or several ultimate divisions which are simple or bifurcate and straight or circinate-curved, linear-filiform, one-nerved, retuse at the apex, $\frac{2}{3}$ — $\frac{1}{2}$ mm in breadth; main rachis slender, hard, margined with very narrow wings on both sides throughout. Sori small, 1—6 to a pinnule, terminating the inner lowest ultimate division of the segments, quite sunk in the frond which forms very narrow wings on both sides of each sorus; involucre subcylindrical, tapering towards the base, a little compressed, very thinly sparse with ascending and adpressed clavate minute glandular scaly hairs, the mouth not dilated, connecting into two lateral obtuse projections, the edge fringed with clavate glandular appendages; receptacular column cetaceous, much exserted beyond the mouth, longest ones being about 1 cm in length; sporangia minute, with laterally compressed large ring.

Trichomanes apifolium Makino H. Kuroiwa's Collections of Liukiu Plants in Bot. Mag., Tokyo, VIII, 1894, p. 412, non Presl, excl. syn.

Nom. Jap. *Kanshinobu-horagoke* (Y. Tashiro).

Hab. RYŪKYŪ (LOOCHOO): Kunchan in Isl. Okinawa (Y. Tashiro! herb. Sc. Coll. Imp. Univ. Tokyo, April 1887), Yaeyama Archip. (Y.

Tashiro ! herb. l. c. Aug. 1887), Nakama-mura in Isl. Iriomote in Yaeyama Archip. (*H. Kuroiwa* ! Aug. 14, 1892).

It resembles *Trichomanes maximum* Blume in general appearance, but the latter species has the creeping rhizome and the dilated mouth of the involucre. W. J. Hooker's *Trichomanes anceps* β in his Species Filicum vol. I. p. 135, may probably contain my species, and then the latter may be found also in Philippine Islands.

Trichomanes acutum Makino Notes on Jap. Plants XV. in Bot. Mag., Tokyo, VI. 1892. p. 45.

Rhizome horizontally wide-creeping, filiform, fuscous-black, tomentose, with loosely short roots. Stipes laxly placed on the rhizome, very short to the longest ones being about 2cm in length, tomentose at the base, margined with wings gradually broader above. Frond small, delicate, ovate, or narrowly ovate, $\frac{2}{3}$ —3cm long, $\frac{2}{3}$ —2cm or more wide, subflabellate-bipinnatifid, or sometimes scarcely subtripinnatifid, thin, subdiaphanous, almost naked, darker yellowish-green when dry, more or less crispate; main rachis broadly winged; pinnæ erect-patent, a few or several on each side, sessile, cuneate-ovate or narrow, pinnatifid or subflabellate into narrowly deltoid very sharply acute and erect-patent segments which are rarely bifurcate in the lowest, furnished with numerous oblique spurious venules. Sori only one to a pinna, axillary, compressed, naked, the tube sunk in frond, subdeltoid, tapering below, distinctly 2-lipped; lip dilated, ovate-deltoid, obtuse at the apex, equal to or a little shorter than the tube, with irregular spurious vein near the margin; receptacle columnar, exserted, straight; sporangium with large ring.

Nom. Jap. *Koke-horagoke* (T. Makino).

Hab. Prov. Tosa: Shiraishi-mura in Hayama-gō (*T. Makino* ! Nov. 11, 1885), Ninotaki in Nanokawa-mura (*T. Makino* ! Nov. 4, 1887), Nanokawa-mura (*K. Watanabe* ! herb. Sc. Coll. Imp. Univ. Tokyo, March 26, 1891).

This species is one of *Didymoglossum* group, and has an affinity to *Trichomanes Filicula* Bory. The sharpness of the ultimate segments makes this species very peculiar. Dr. H. Christ's Diagnosis of the species was published in the "Bulletin de l'Herbier Boissier," IV. 1896, p. 665; and the figure, together with above described *Hymenophyllum oligosorum*, and *flexile*, will appear in the fore-coming number of my "Phanerogamæ et Pteridophytæ Japonicæ iconibus illustratæ."

Polypodium (Phymatodes) **annuifrons** Makino Phanerog. et Pterid. Jap. icon. illustr. I. tab. 7.

Rhizome creeping, attaining the length of several inches, stout-wiry, flexuous, often loosely branched, sending fibrous roots below, bears a few fronds above, scattered with small tubercles, the basal remains of old stipes, and covered with adpressed minute scales which are ovate-deltoid eroso-denticulate dark-brown and often deciduous in age. Stipes loosely placed, articulated at the base, hard, naked, smooth, slender, terete, slightly compressed, stramineous, with 2 fibro-vascular bundles within, about 1—3 cm in length, the base clothed with scales which are narrowly deltoid, lacerate, fuscous-brown, and $1\frac{1}{2}$ —2 mm long. Frond annual, lanceolate, sometimes falcate, about 9—23 cm long, $1\frac{1}{2}$ —3 cm broad, gradually attenuated above into an obtusely or sub-acutely acuminate apex, acute at the base and slightly decurrent to the stipe, entire, somewhat crispate, chartaceous, light green, paler beneath, naked but very thinly scaly on the lower portion of the midrib beneath, sparsely and very minutely nigro-punctate on the upper surface; midrib slender, prominent above, stramineous; venation immersed and superficially invisible; veins erect-patent, not distinct, in distance of about 4—6 mm one another; veinlets forming irregularly small copious and obliquely angular-suboblong areolæ, including a widely divaricately once or twice bifurcate free veinlet with a minute tubercle at the end. Sori occupying the upper portion of the frond, in a single row midway between the midrib and margin or rather nearer the midrib, a little apart from one another, rounded, $1\frac{1}{2}$ —3 mm in diameter, very shallowly sunk, forming very low protuberances on the back, prominent, yellow, mixed with suborbicular erose and long pedicellate peltate scales among long pedicellate sporangia.

Polypodium japonense Makino Contr. Stud. Fl. Jap. in Bot. Mag., Tokyo, XII. p. 165.

Polypodium Schraderi Maxim. in litt. non Metten.

Nom. Jap. *Hotei-shida*.

Hab. Prov. SHIMOTSUKE: Mt. Nikkō (Herb.! Sc. Coll. Imp. Univ. Tokyo, Oct. 1, 1879); Prov. SHINANO: Kiso (Herb.! l. c. July 29, 1880); Prov. KAGA: Mt. Haku-san (Herb.! l. c. Aug. 6, 1881); Prov. ISHIKARI: Sapporo (Herb.! l. c. July 31, 1878); Prov. TOSA: Nanokawa (*T. Makino*! Nov. 1884, June 10, 1885), Mt. Hōnokawa-yama (*T. Makino*! Aug. 1889); Prov. MUSASHI: Iwatozawa in Chichibu (*T. Makino*! July 15, 1888).

This species is found throughout the country, and growing on the bark of large trees in mountainous districts. The fronds are entirely annual

(*To be continued.*)