Osmundaceae of Formosa[1)]

By Motozi TAGAWA

田川基二: 臺灣産ぜんまい科ノ分類

Conspectus of living genera of *Osmundaceae*

The present-day pteridologists are in general agreement concerning the segregation of the living species of *Osmundaceae* into three genera, *Osmunda, Todea,* and *Leptopteris.* Of these *Osmunda* is divided into three sections, Euosmunda, Osmundastrum, and Planasium; these are well characterized, and it is more appropriate to treat them as distinct genera. The living *Osmundaceae* are here divided into five genera belonging to two subfamilies.

I. Osmundoideae

Sporangia marginal on much reduced pinnules, entirely replacing the vegetative tissue, and in dense paniculate clusters. Rhizome creeping or erect, mostly suterranean; leaves wholly or partially dimorphic.

1) **Osmunda** TOURNEF.; L. Gen. Pl. ed. 5. 484. 1754; DIELS in ENGL. et PRANTL, Nat. Pflanzenfam. **1**[4]. 378. 1900. pro parte; NAKAI in Bot. Mag. Tokyo **41**. 674. 1927. pro parte.

Osmunda sect. Euosmunda PR. apud MILDE, Monogr. Gen. Osmundae 54. 1868; DIELS, l. c. 380; NAKAI, l. c. 678.

Leaves bipinnate, herbaceous to chartaceous, withering in winter, wholly or partially dimorphic, in dense crown, arranged in two circles, the inner fertile and erect, the outer sterile and spreading; pinnae and pinnules not articulated to the rachis, with venatio Neuropteridis or Sphenopteridis.

Five species in the temperate and tropical regions of the world:—*O. regalis* L. with several geographic varieties, *O. gracilis* LINK, *O. Mildei* C. CHR., *O. japonica* THUNB. with one variety, *O. lancea* THUNB. (*O. japonica*

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var. *intermedia* HONDA[2] from Japan is nothing but a form with broader pinnules and is hardly worthy of varietal recognition).

Pinnae and pinnules are said to be jointed to the rachis, but they had better be said to be not articulated to the rachis, for the joints are rudimentary and not functional at all.

2) **Osmundastrum** (PR.) PR. in Abh. Böhm. Ges. Wiss. V. **5**. 326. 1848. pro parte.

Osmunda sect. Osmundastrum PR. Suppl. Tent. Pterid. 130. 1845; DIELS, l. c. 379; NAKAI, l. c. 676.

Leaves pinnate, herbaceous, withering in winter, wholly or partially dimorphic; pinnae pectinately pinnati-parted, obscurely articulated to the rachis, with venatio Pecopteridis; otherwise like *Osmunda*.

Two species in America and eastern Asia:—*O. cinnamomeum* (L.) PR. with two geographic varieties, *O. Claytonianum* (L.) with one geographic variety.

The joint of pinna is as a rule functionless; but when leaves suffer in the press, it functionates, separating some pinnae from the rachis.

3) **Plenasium** PR. Tent. Pterid. 109. 1836.

Osmunda sect. Plenasium (PR.) MILDE, l. c. 109; DIELS, l. c. 378; NAKAI, l. c. 675.

Leaves pinnate, mostly coriaceous, evergreen, partially dimorphic; pinnae entire to largely serrate, distinctly articulated to the rachis, with venatio Pecopteridis; otherwise like *Osmunda*.

Five species in tropical and subtropical Asia:—*P. bromeliaefolium* (PR.) PR., *P. banksiaefolium* (PR.) PR., *P. herbaceum* (COP.[3]) comb. nov., *O. Vachelii* (HOOK.) PR., *P. javanicum* (BL.) PR.

The joint of pinna is functional; nearly all pinnae fall off the rachis, when leaves die or suffer in the press. In *P. javanicum* and *P. Vachelii* veins are dichotomous (venatio Neuropteridis), but originally of Pecopteris-type.

II. Todeoideae

Sporangia superficial on the underside of unaltered pinnules, born along

2) Bot. Mag. Tokyo **44**. 409. 1930.

3) *Osmunda herbacea* COP. in Phil. Journ. Sci. **40**. 291. 1929.

the veins. Caudex often subarborescent; leaves monomorphic.

4) **Todea** WILLD. in Schrift. Akad. Erfurt. **1802**. 14; DIELS, l. c. 377. Lamina 8 to 12 cell layers thick; epidermis with stomata.

One species in Australia, New Zealand, and South Africa:—*T. barbata* (L.) MOORE.

5) **Leptopteris** PR. Suppl. Tent. Pterid. 70. 1845; DILES, l. c. 378. Lamina translucent, filmy, 2 or 3 cell layers thick; epidermis without stomata.

Six species from New Zealand to Polynesia and Melanesia:—*L. alpina* (BAK.) C. CHR., *L. Fraseri* (HOOK. et GREV.) PR., *L. hymenophylloides* (A. RICH.) PR., *L. Moorei* (BAK.) CHRIST, *L. superba* (COL.) PR., *L. Wilkesiana* (BRACK.) CHRIST.

Formosan species of *Osmundaceae*[4]

In Formosa *Osmundaceae* are represented by four species falling into three genera; of these *Plenasium banksiaefolium* is most abundant. They may be distinguished thus:

A) Leaves bipinnate, normally entirely dimorphic, sometimes with apical portion fertile; pinnules lanceolate to ovate-oblong, 1 to 2.5 cm. wide. ..... 1) *Osmunda japonica*

A) Leaves pinnate.

B) Sterile pinnae pectinately pinnati-parted, herbaceous, obscurely articulated to the rachis.

C) Leaves entirely dimorphic; sterile pinnae long-acuminate or acuminate. ..... 2) *Osmundastrum cinnamomeum* var. *fokiense*

C) Leaves partially dimorphic with median portion fertile; sterile pinnae short-acute, often bluntish. ..... 3) *Osmundastrum Claytonianum* var. *vestitum*

B) Sterile pinnae coarsely serrate, nearly coriaceous, perfectly articulated to the rachis; leaves partially dimorphic, with median portion fertile. ..... 4) *Plenasium banksiaefolium*

1) **Osmunda japonica** THUNB. in Nov. Acta Reg. Soc. Sci. Upsal. **2**. 209. 1780; Fl. Jap. 330. 1784; NAKAI in Bot. Mag. Tokyo **41**. 679. 1927. cum

[4] The writer has examined all of the material of Formosan *Osmundaceae* available in the herbaria of the Kyoto Imperial University and the Tokyo Imperial University, which have been abbreviated in the text as K and T respectively.

syn.; HAND.-MZT. Synb. Sin. **6**. 15. 1929; OGATA, Ic. Fil. Jap. **5**. pl. 240. 1933; CHING in Sinensia **3**. 322. 1933; C. CHR. Ind. Fil. Suppl. III. 134. 1934; HARA in Bot. Mag. Tokyo **48**. 703. 1934; MAKINO, Ill. Fl. Nipp. 964. fig. 2891. 1940.

Osmunda regalis var. *japonica* (THUNB.) MILDE, Fil. Eur. Atl. 179. 1867; MIYABE et KUDO, Fl. Hokk. Saghal. 44, 1930; TATEWAKI et KIMOTO in Acta Phytotax. Geobot. **1**. 239. 1932.

Osmunda regalis auct.; HAYATA, Ic. Pl. Form. **4**. 135. 1914; Gen. Ind. 115. 1917.

Osmunda japonica var. *sublancea* NAKAI, l. c. 681. non *O. regalis* var. *sublancea* CHRIST; SASAKI, List. Pl. Form. 43. 1928; MASAM. Short Fl. Form. 31. 1936.

Osmunda nipponica MAKINO in Bot. Mag. Tokyo **26**. 385. 1912; NAKAI, l. c. 681. Although the writer has not yet had opportunity to study authentic material of this, MAKINO's original description so strongly suggests an abnormal form of *O. japonica* that it seems best tentatively to list the name in the synonymy of this species.

Nom. Jap. *Zenmai, Taiwan-zenmai, Ha-zenmai, Ko-zenmai.*

Hab. Northern and central part of the Island, rather rare. Specimens examined:

Prov. Taihoku: Kinpoli secus orizeta (U. FAURIE, without number, *May 1915,* K); Tikusiko (Y. SIMADA, *July 5, 1915,* T). Prov. Taityū: Oiwake (B. HAYATA, *1916,* T); Saramao (E. MATUDA, T).

Distr. Southern Saghalien, Hokkaidō, Honsyū, Sikoku, Kyūsyū, Korea, Ryūkyū, Formosa, China, and eastern Himalayas.

Of these four specimens FAURIE's plants differ markedly from the common form of this species in its much smaller size and in the pinnules of different shape, but otherwise like *O. japonica*; the diagnosis is given below:

Leaves both fertile and sterile much smaller and more slender. Sterile leaves with stipe 10 to 18 cm long; lamina ovate in outline, 13 to 15 cm long by 8 to 10 cm wide, herbaceous; pinnae 3 or 4 in strict pairs below the ternimal one, the basal 2 pairs pinnate and short-stalked, 5 to 9 cm long by 3 to 5 cm wide, with a oblong-lanceolate distal pinnule cuneate at the base,

the following simple, oblong or oblong-lanceolate, sessile, 2 to 4.5 cm long by 9 to 12 mm wide; pinnules 3 or 4 in pairs, oblong, obtuse or rounded, sessile, obliquely round-truncate at the base, 2 to 3 cm long by 8 to 12 mm wide, the margin very finely serrate, the veins mostly 2-forked. Fertile leaves to 30 cm long including stipe, fertile lamina somewhat laxer.

Prof. NAKAI referred the Formosan material preserved in the herbarium of Tokyo Imperial University to a variety from Quelpaert, *O. regalis* var. *sublancea* CHRIST,[5] and called it *O. japonica* var. *sublancea* NAKAI; but his var. *sublancea* represents a form with somewhat narrower pinnules and is hardly worthy of varietal recognition. CHRIST's var. sublancea based on FAURIE No. 2166 from Quelpaert, is, I think, a distinct variety of *O. japonica*. It was characterized by "Ab *O. lancea* Thunb. valde simili differt folio vegetativo parte fertili coronato; a typo recedit pinnulis valde elongatis lanceolatis, inferioribus basi ovatis sive subcordatis, superioribus basi attenuatis." The shape and size of pinnules are very characteristic of this variety: pinnules much narrower and more numerous, narrowly lanceolate, gradually attenuated towards the acute apex, 3 to 5 cm long by 5 to 7 mm wide, otherwise like *O. japonica*.

2) **Osmundastrum cinnamomeum** (L.) PR. in Abh. Böhm. Ges. Wiss. V. **5**. 326. 1848.

Osmunda cinnamomea L. Sp. Pl. **2**. 1066. 1753; FERNALD in Rhodola **32**. 75. 1930.

The Asiatic *O. cinnamomeum* was definitely described by FERNALD as a new geographic variety, *Osmunda cinnamomea* var. *asiatica* FERNALD, characterized by "Lamina fertili plus minusve nigricanti-villosa; stipitum rachiumque vestimento rufescenti." In 1909 COPELAND published a Chinese variety, *Osmunda cinnamomea* var. *fokiensis* COP., characterized by "Frond less than 1 m high including stipe, about 10 cm broad, when very young ciliate, especially in the sinuses, otherwise practically glabrous, coriaceous; segments almost straight, oblong, rounded." Var. *fokiensis* was intended as the name for an anusual form hardly worthy of varietal recognition, but we may use this varietal name for all Asiatic plants, for it is the oldest name of varietal

5) FEDDE, Repert. **5**. 284. 1908.

rank for the Asiatic *Osmundastrum cinnamomeum.*

var. **fokiense** (COP.) TAGAWA, comb. nov.

Osmunda cinnamomea var. *fokiensis* COP. in Phil. Journ. Sci. **4**. 16. 1909. ut var. *fokiense.*

Osmunda cinnamomea var. *asiatica* FERNALD, l. c.; KOM. et KLOB.-ALIS. Key Pl. Far East. Reg. USSR. **1**. 90. t. 18. 1931; HARA in Bot. Mag. Tokyo **48**. 703. 1934; KITAGAWA, Lin. Fl. Mansh. 40. 1939.

Osmunda cinnamomea auct.; MATTHEW in Journ. Linn. Soc. **39**. 375. 1911; NAKAI in Bot. Mag. Tokyo **41**. 675. 1927; HAND.-MZT. Synb. Sin. **6**. 15. 1929; FOMIN in Fl. Sib. Or. Extr. **5**. 193. 1930; MIYABE et KUDO, Fl. Hokk. Saghal. 43. 1930; OGATA, Ic. Fil. Jap. **5**. pl. 238. 1933; MASAM. Short Fl. Form. 31. 1936; MAKINO, Ill. Fl. Nipp. 969. fig. 2893. 1940.

Nom. Jap. *Yamadori-zenmai, Yamadori-sida.*

Hab. Northern district of the Island, rare. Specimens examined:

Prov. Taihoku: between Kyanrawa and Sikikun, Ratō-gun (J. OHWI, 2494, *May 27, 1933,* K).

Distr. Amur, Ussuri, Manchuria, Korea, Saghalien, southern Kuriles, Hokkaidō, Honsyū, Sikoku, Kyūsyū, Formosa, and China (Fukien, Hunan, Kweichow, Yunnan).

OHWI No. 2494 is a rather smaller plant with the rufescent tomentum characteristic of the Asiatic variety. The diagnosis drawn from this specimen is given below:

Tomentum of stipe, rachis, and fertile frond rufescent, that of the fertile frond with many blackish trichomes intermixed; sterile frond with stipe about 20 cm long, the lamina narrowly elliptic-lanceolate, about 30 cm long by 8 to 10 cm wide, gradually narrowed above, acuminate, herbaceous, the pinnae mostly in pairs, but not quite opposite, narrowly lanceolate, long-acute or acuminate, 4 to 6 cm long by 1 to 1.5 cm wide, nearly straight or slightly curved up towards the apex, the segments close, slightly falcate, obtuse or rounded, 3 to 4 mm wide, the veinlets once-forked, erect-patent; fertile frond with stipe about 30 cm long, the lamina about 20 cm long, the lower pinnae about 3 cm long.

3) **Osmundastrum Claytonianum** (L.) TAGAWA, comb. nov.

Osmunda Claytonianum L. Sp. Pl. **2**. 1066. 1753; C. Chr. Ind. Fil. 473. 1906. pro parte; Nakai in Bot. Mag. Tokyo **41**. 677. 1927; Fomin in Fl. Sib. Or. Extr. **5**. 195. cum fig. 1930; Fernald in Rhodola **32**. 73. 1930; Ogata, Ic. Fil. Jap. **5**. pl. 239. 1933; Kom. Fl. URSS. **1**. 88. 1934; Broun, Ind. N. Am. Ferns 127. 1938; Kitagawa, Lin. Fl. Mansh. 40. 1939; Makino, Ill. Fl. Nipp. 965. fig. 2894. 1940.

Nom. Jap. *Oni-zenmai.*

Hab. Eastern North America (Newfoundland to Manitoba, south to Georgia and northern Arkansas, and also Greenland), Ussuri and eastern Manchuria, Korea,[6] and Japan[7] (central Honsyū).

In Asia *O. Claytonianum* has been recorded from Japan, Korea, Ussuri, eastern Manchuria, Yunnan, Szechuan, Himalayas, and Formosa. Fernald distinguished the plant of the Sino-Himalayan area from typical *O. Claytonianum* by the deep-ferruginous tomentum on stipe and rachis, and treated it as a geographic variety, *Osmunda Claytoniana* var. *vestita* (Wall.) Milde. As to the plants from other regions, he said, "Whether the plant of easternmost Asia is all the same as the Himalayan I cannot say, as the Asiatic material in the Gray Herbarium is all from the Himalayan area; but the Asiatic plant is presumably all of a single variety." The plant from Formosa, known as *Osmunda Claytoniana* by Japanese botanists, is perfectly identical with the Sino-Himalayan variety just as he had supposed. But the material from Japan and Korea are all referable to the type variety of *O. Claytonianum,* in which the tomentum is whitish-brown; and the plant from Ussuri and eastern Manchuria may be also typical, though I have examined no authentic specimens.

var. **vestitum** (Wall.) Tagawa, comb. nov.

Osmunda monticola Wall. *β. vestita* Wall. List. n. 52. 1828.

Osmunda Claytoniana var. *vestita* (Wall.) Milde, Monogr. Gen. Osmundae 102. 1868; Fernald, l. c.

Osmunda pilosa Wall. ex Hook. et Grev. in Hook. Bot. Misc. **3**. 229. 1833.

6) Korea. Prov. Kankyō-hokudō: Kyonson (J. Ohwi, 129, *May 26, 1930,* K); near Ranan (T. Saitō, 548, *June 2, 1933,* K; 1930, *Aug. 8, 1935,* K).

7) Honsyū. Prov. Sinano: Kirigamine (J. Ohwi, 8292, *Aug. 1, 1935,* K).

Osmunda Claytoniana var. *lanosa* C. CHR. in LEVÉILLÉ, Pl. Yun-nan 107. 1916.

Osmunda Claytoniana auct.; BEDD. Ferns Brit. Ind. t. 187. 1866; Handb. 449. 1883; MILDE, Fil. Eur. Atl. 183. 1867. pro parte; HOOK. et BAK. Syn. Fil. 426. 1868. pro parte; CLARKE in Tr. Linn. Soc. II. Bot. **1**. 582. 1880; C. CHR. Ind. Fil. 473. 1906. pro parte; MATTHEW in Journ. Linn. Soc. **39**. 375. 1911; HAND.-MZT. Synb. Sin. **6**. 15. 1929; MASAM. in Journ. Trop. Agr. **2**. 151. 1930; Short. Fl. Form. 31. 1936.

Osmunda cinnamomea L. sensu YAMAM. Suppl. Ic. Pl. Form. **5**. 6. 1932.

Nom. Jap. *Taiwan-onizenmai,* nom. nov.

Hab. Central district, very rare. Specimens examined:

Prov. Taityū: Saramao (E. MATUDA, *Aug. 11, 1919,* T). Prov. Tainan: Mt. Arisan (J. OHWI, 3597, *July 4, 1933,* K).

Distr. Himalayas, Yunnan, Szechuan, and east to Formosa.

OHWI No. 3597 is a large sterile frond with the rufescent tomentum characteristic of this variety. The diagnosis is:

Stipe 30 cm long; tomentum of stipe and rachis deep-ferruginous; lamina narrowly elliptic-lanceolate, 80 cm long by 23 cm wide, abruptly short-acuminate, firm-herbaceous; pinnae numerous, close, nearly opposite, sessile, lanceolate, straight, rather short-acute, obtuse, glabrous, the central ones the largest, to 12 cm long by 3.5 cm wide; segments close, somewhat falcate, oblong, round, 6 to 7 mm wide; veinlets numerous, once-forked, slightly ascending.

4) **Plenasium banksiaefolium** (PR.) PR. Tent. Pterid. 110. 1836.

Nephrodium banksiaefolium PR. Rel. Haenk. **1**. 34. 1825.

Osmunda banksiaefolia (PR.) KUHN in Ann. Lugd. Bat. **4**. 299. 1869. excl. syn., descr. et pl.; COP. in Phil. Journ. Sci. **4**. 16. 1909.

Osmunda javanica BL. sensu BAK. in Journ. Bot. **23**. 107. 1885; CHRIST in WARB. Mons. **1**. 91. 1900; HENRY, List Pl. Form. 116. 1896; YABE in Bot. Mag. Tokyo **16**. 52. 1902; MATSUM. Ind. Pl. Jap. **1**. 331. 1904; MATSUM. et HAYATA, Enum. Pl. Form. 561. 1906; HAYATA, Gen. Ind. 115. 1917.

Osmunda bromeliaefolia COP. sensu NAKAI in Bot. Mag. Tokyo **41**. 675. 1927; SASAKI, List Pl. Form. 43. 1928; MASAM. Short Fl. Form. 31. 1936;

OGATA, Ic. Fil. Jap. **5**. pl. 237. 1933.

Rhizome very large, stout, erect or obliquely ascending. Stipe stout, 20 to 60 cm or more long. Lamina to 1.5 m long, 20 to 50 cm wide, oblong to oblong-lanceolate, pinnate, chataceous to coriaceous; sterile pinnae numerous, erect-patent, short-stalked, linear-lanceolate, long-acuminate at the apex, acute or acuminate at the base, 10 to 20 cm long by 1 to 2 cm wide, coarsely serrate with large teeth, separated by acute or obtuse or sometimes rounded sinuses, the teeth obliquely triangular, 1.5 to 3 mm high or rarely to 5 mm, acute or acuminate, terminating in short-mucronate tip, the margin thickened, entire or very rarely obscurely serrurate; veins rather ascending, pinnate, the veinlets mostly forked.

Nom. Jap. *Siroyama-zenmai.*

Hab. Most abundant in low-lying mountainous districts throughout the Island. Specimens examined:

Prov. Taihoku: Shakko (U. FAURIE, 230, *Dec. 1914,* K); Kīrun (S. NAGASAWA, 443, *June 5, 1904,* K); Tikusiko (M. TAGAWA, 62, *Aug. 28, 1934,* K); Hokuto (S. MIKI, *Dec. 1925,* K); between Syōkakuto and Sinten (K. MIYAKE, *Oct. 19, 1899,* T); Denryōkō, Kīrun (C. ŌWATARI, *Nov. 5, 1896,* T); Syaryōtō, Kīrun (T. MAKINO, *Nov. 3, 1896,* T); between Sekizyō and Heirinbi (K. MIYAKE, *Oct. 27, 1899,* T). Prov. Sintiku: Sintiku (T. MAKINO, *Nov. 24, 1896,* T). Prov. Taityū: between Suiteiryō and Tōseikaku (C. ŌWATARI, *Jan. 16, 1898,* T). Prov. Kwarenkō: inter Batakan et Busegan (M. TATEWAKI et S. KITAMURA, *March 17, 1932,* K); Taroko (T. SATŌ, *Oct. 22, 1935,* T); Naitaroko (E. MATUDA, *Aug. 10, 1918,* T). Prov. Takao: Tona, Kizan-gun (M. TAGAWA, 1985, *Jan. 12, 1939,* K). Prov. Taitō: near Zyomoru, Taitō-gun (M. TAGAWA, 2857, *Feb. 8, 1940,* K); Isl. Kōtō-syo (K. MIYAKE, *Nov. 20, 1899,* T).

Distr. Philippines, Moluccas, Cochin-China, South China, Formosa, Ryūkyū, Japan (Kyūsyū, Sikoku), and east to Bonins.

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to examine the material available in the Herbarium of the Tokyo Imperial University.

摘　要

Osmundaceae ぜんまい科ノ現生種ハ今日一般ニ *Osmunda* ぜんまい屬、*Todea* とであ屬、*Leptopteris* れぷとぷてりす屬ノ3屬ニ分類セラレ、コノウチぜんまい屬ハ更ニ Euosmunda ぜんまい節、Osmundastrum やまどりぜんまい節、Plenasium しろやまぜんまい節ノ3節ニ分ケラレテキル。シカシコレラノ現生種ハ次ノ如ク2亜科5屬ニ分類スルノガ適當デアルト思フ。

Osumundoideae ぜんまい亜科

胞子嚢ハ縮小シタ羽片ノ全周ニ密生シ、穗狀ノ胞子穗ヲ形成スル、根莖ハ匍匐又ハ直立シ一般ニ地中生、葉ニハ裸葉ト胞子葉ノ別アルカ又ハ一部ノ羽片ガ胞子穗トナル。

1) **Osmunda** TOURNEF., *Osmunda* § Euosmunda PR. **ぜんまい屬** 葉ハ2回羽狀複葉、草質又ハ紙質、冬季ハ枯死スル、裸葉ト胞子葉ノ別ガアルカ又ハ上部ノ羽片ガ胞子穗トナル、羽片及ビ小羽片ト各主軸及ビ枝軸トハ節合セズ、側脈ハ何回カ叉狀ニ分岐スル。全世界ノ溫帶ヨリ熱帶ニ亙リ5種アル。羽片ヤ小羽片ガ各主軸ヤ枝軸ニ著ク所ハ關節ノヤウナ構造ヲ示シテキルガ、コレハ關節トイフベキ程ノモノデハナク、從ツテ羽片ヤ小羽片ガ散ルヤウナコトハナイ。

2) **Osmundastrum** (PR.) PR., *Osmunda* § Osmundastrum PR. **やまどりぜんまい屬** 葉ハ單羽狀複葉、草質、冬季ハ枯死スル、裸葉ト胞子葉ノ別ガアルカ又ハ下部ノ羽片ガ胞子穗トナル、羽片ハ羽狀ニ深裂シ、不明瞭ニ主軸ト節合スル、側脈（裂片ノ中肋）ハ羽狀ニ分岐シ、細脈ハ多クハ2叉スル。亜米利加及ビ東亜ニ2種アル。主軸ト羽片トノ間ニアル關節ハ不明瞭ナモノデ且ツ機能モナク、葉ハ枯レテモ羽片ガ散ルヤウナコトハナイ。シカシ腊葉ニ乾燥スルトキ蒸レタリスルト、中ニハ散ル羽片モデキル。

3) **Plenasium** PR., *Osmunda* § Plenasium (PR.) MILDE **しろやまぜんまい屬** 葉ハ羽狀複葉、一般ニ革質、常綠、下部ノ羽片ガ胞子穗トナル、羽片ハ全邊又ハ粗大ノ鋸齒アリ、明瞭ニ主軸ト節合スル、側脈ハ羽狀ニ分岐シ、細脈ハ2叉スルコトモアル。亜細亜ノ熱帶ヤ亜熱帶ニ5種アル。主軸ト羽片トノ間ニアル關節ハコノ屬デハヨク發達シタモノデ、葉ガ枯死スルト多クノ羽片ハ散ル。又腊葉ニ乾燥スルウチニモ羽片ハ脫落シヤスイ。コレハしろやまぜんまいデヨク經驗スルコトデアル。

Todeoideae とであ亜科

胞子嚢ハ變形シナイ羽片ノ下面脈上ニアル。莖ハシバシバ木狀、裸葉胞子葉ノ別ガナイ。

4) **Todea** WILLD. **とであ屬** 葉ノ組織ハ8–12層ノ細胞ヨリナリ、表皮ニハ氣孔ガア

ル。濠洲、ニュージーランド、南阿ニ唯1種アル。

5) **Leptopteris** Pr. **れぷとぷてりす屬** 葉ハ透明ナル膜質デ2-3層ノ細胞ヨリナリ、表皮ニハ氣孔ガナイ。ニュージーランド、ポリネシヤ、メラネシヤニ6種アル。

以上ノ分類ニ從ヘバ臺灣ノぜんまい科ニハ3屬4種アル。

1) **Osmunda japonica** Thunb., *O. regalis* var. *japonica* Milde, *O. biformis* Makino, *O. nipponica* Makino **ぜんまい**、 たいわんぜんまい、はぜんまい、こぜんまい中部北部ニアルガ普通品デハナイ。臺灣ノぜんまいハ濟州島ノ **O. japonica** var. **sublancea** (Christ) Nakai **ほそばぜんまい** デアルトイハレテヰルガ、普通ノぜんまいニスギヌト思フ。眞ノほそばぜんまいハ Faurie ガ濟州島デ採集シタ標本 No. 2166 ヲ基準標本トスル變種デ、小羽片ハ狹披針形、長サ 3-5 糎、幅ハ 5-7 粍ニスギヌ。又 *O. nipponica* Makino こぜんまいトイフノハ恐ラクぜんまいノ畸型デアラウ。ぜんまいハ東亞ノ溫帶暖帶ニ廣ク分布シ、樺太南部（海馬島）、北海道、本州、四國、九州、朝鮮、琉球、臺灣、支那、ヒマラヤ東部ニアル。

2) **Osmundastrum cinnamomeum** (L.) Pr. var. **fokiense** (Cop.) Tagawa, *Osmunda cinnamomea* var. *fokiensis* Cop., *O. cinnamomea* var. *asiatica* Fernald, *O. cinnamomea* auct. **やまどりぜんまい** 近年臺北州下ニ發見セラレタガ稀品デアル。やまどりぜんまいハ北米ノ *O. cinnamomeum* ソノモノデアルト思ハレテヰタガ、綿毛ハ赤褐色デ黑色ノ毛ヲ混ジテヰルカラ Fernald ハ變種ニシテ *Osmunda cinnamonea* var. *asiatica* Fernald ト命名シタガ、コレヨリモ早ク支那產ノモノニ *Osmunda cinnamomea* var. *fokiensis* Cop. トイフ學名ガツイテヰルカラ、やまどりぜんまいノ學名ヲ上記ノ如ク變更シタ。やまどりぜんまいハ東亞ノ溫帶暖帶ニ廣ク分布シ、滿洲、朝鮮、樺太、千島、北海道、本州、四國、九州、臺灣、支那ニアル。

3) **Osmundastrum Claytonianum** (L.) Tagawa var. **vestitum** (Wall.) Tagawa, *Osmunda Claytoniana* var. *vestita* (Wall.) Milde **たいわんおにぜんまい** (新稱) 臺中州サラマヲ、臺南州阿里山等ニアルガ稀品デアル。臺灣ノモノハ綿毛ガ赤褐色デアルカラ支那ヤヒマラヤニアル上記ノ變種デアル。滿洲東部、朝鮮北部、本州中部ニアル **おにぜんまい** ハ綿毛ガ灰白色又ハ帶褐灰色デ北米ノ **O. Claytonianum** (L.) Tagawa ソノモノデアル。

4) **Plenasium banksiaefolium** (Pr.) Pr., *Osmunda bromeliaefolia* auct. jap. **しろやまぜんまい** 全島ノ低地ニ普通ニアル種類、小笠原、四國、九州、琉球、臺灣、南支、交趾支那、フイリツピン、モルツカト分布ハ廣イ。

日本ニハ以上ノ外ニナホ特產ノ **Osmunda lancea** Thunb. **やしやぜんまい**ガ北海道、本州、四國、九州ニアル。 *O. japonica* var. *intermedia* Honda おくたまぜんまいトイフノハやしやぜんまいノ小羽片ノ幅ノ少シ廣イ一型ニスギヌ。

日本産ぜんまい科の檢索表

A) 葉ハ2回羽狀複葉、裸葉胞子葉ノ別ガアルカ又ハ上部ノ羽片ガ胞子穗ニ變化スル(ぜんまい屬)

B) 小羽片ハ披針形又ハ狹披針形、基底ハ銳尖形デ短イ小柄ガアル....やしやぜんまい

B) 小羽片ハ無柄、基底ハ截形又ハ圓形、稀ニ微心形又ハ廣楔形

C) 小羽片ハ披針形又ハ卵狀長橢圓形、幅 1~2.5 糎 .....ぜんまい

C) 小羽片ハ狹披針形、幅 5~7 粍 .....ほそばぜんまい

A) 葉ハ單羽狀複葉

B) 羽片ハ革質、粗大ノ鋸齒アリ、主軸ト明瞭ニ節合スル、下部ノ羽片ガ胞子穗トナル(しろやまぜんまい屬).....しろやまぜんまい

B) 羽片ハ羽狀ニ深裂シ草質、主軸ト不明瞭ニ節合スル (やまどりぜんまい屬)

C) 裸葉胞子葉ノ別アリ、胞子囊ハ胞子脫出後赭褐色トナル、羽片ハ銳尖頭銳尖端、綿毛ハ赤褐色デ黑色ノ毛ヲ混ズ .....やまどりぜんまい

C) 下部ノ羽片ガ胞子穗トナル、胞子囊ハ胞子脫出後黑褐色トナル、羽片ハ銳頭鈍端

D) 綿毛ハ灰白色又ハ帶褐灰色 .....おにぜんまい

D) 綿毛ハ赤褐色.....たいわんおにぜんまい