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The Hymenophyllaceae of the Pacific Area. 2. *Hymenophyllum* (Excluding Subgen. *Hymenophyllum*)

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Abstract Pacific species of *Hymenophyllum* subgen. *Sphaerocionium*, *Mecodium*, *Globosa*, *Pleuromanes*, *Myrmecostylum*, *Fuciformia*, *Diploöphyllum* and *Cardiomanes* are enumerated. In total, 37 species are recorded in the studied area, and synonymies, information of the type material, distribution and cytological records of each species are provided.

Key words: Australasia, filmy ferns, Hymenophyllaceae, *Hymenophyllum*, Oceania, Pteridophyta.

Genus 1. Hymenophyllum Sm., Mém. Acad. Sci. Turin **5**: 418 (1793), continued from Bull. Natl. Mus. Nat. Sci., Ser. B, 33(2): 55–68 (2007).

In total 63 species of *Hymenophyllum* are distributed in the Pacific region; species richness is nearly the same as the Malesian region. Compared with the Trichomanoid genera, *Hymenophyllum* includes more local endemic species, especially in New Caledonia, New Zealand and Hawaii. Two subgenera, *Diploöphyllum* and *Cardiomanes*, are endemic to New Zealand, and this region is probably the center of diversity of subgen. *Pleuromanes*. Subgenus *Hymenophyllum* was enumerated in Ebihara and Iwatsuki (2007); the remaining subgenera are enumerated here. Distribution of the species are listed in Table 1.

Subgenus 2. Sphaerocionium (C. Presl) C. Chr.

27. **Hymenophyllum malingii** (Hook. f.) Mett., Hymenophyllaceae 489 (1864). [Fig. 1]

— *Trichomanes malingii* Hook. f., Gard. Ferns t. 64 (1862) — *Apteropteris malingii* (Hook. f.) Copel., Philipp. J. Sci. **67**: 35. t. 1 (1938) — *Sphaerocionium malingii* (Hook. f.) K. Iwats., J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. **13**: 214 (1982).

Lectotype: Brunner s.n. (New Zealand, Mountains between Blind Bay and Massacre Bay) [K* (*=*n. v.*, otherwise at least one of the authors examined the type specimens)], designated by Tindale (1963).

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie in Fabbri, 1963; Brownlie, 1965, New Zealand).

Note: This species was formerly assigned to the monotypic genus *Apteropteris* (Copeland, 1938). Its stellate hairs suggest a relationship with *Sphaerocionium*, but the narrower lamina is peculiar to this species.

28. **Hymenophyllum applanatum** (A. M. Gray et R. G. Williams) Ebihara et K. Iwats. **comb. nov.** [Fig. 2]

— *Apteropteris applanata* A. M. Gray et R. G. Williams, Muelleria **4**: 169 (1979) — *Sphaerocionium applanatum* (A. M. Gray et R. G. Williams) K. Iwats., J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. **13**: 214 (1982).

Table 1. Distribution of the species of *Hymenophyllum* (excluding subgen. *Hymenophyllum*) in the Pacific area

	Caroline Isls.	Solomon Isls.	Vanuatu	New Caledonia	Fiji	Samoa	French Polynesia	Australia	New Zealand	Hawaii
Hymenophyllum										
subgen. Sphaerocionium										
27 *H. malingii*									++	
28 *H. applanatum*								++		
29 *H. subobtusum*				++						
30 *H. frankliniae*									++	
31 *H. lyallii*				+				+	+	
32 *H. digitatum*	+	+	+			+	+	+		
33 *H. tomaniiviense*			+		+					
34 *H. braithwaitei*			+	+						
35 *H. lanceolatum*										++
36 *H. obtusum*										++
subgen. Mecodium										
37 *H. polyanthos*		+	+		+	+	+	+		
38 *H. mnioides*				+						
39 *H. rarum*								+	+	
40 *H. whitei*								++		
41 *H. recurvum*										++
subgen. Globosa										
42 *H. demissum*									++	
43 *H. imbricatum*		+	+	+	+	+	+			
44 *H. junghuhnii*		+	+							
45 *H. reinwardtii*	+									
46 *H. australe*								+	+	
47 *H. javanicum*			+	+	+	+	+	+	+	
48 *H. flexuosum*									++	
49 *H. eboracense*								++		
50 *H. angulosum*		+	+							
subgen. Pleuromanes										
51 *H. flabellatum*			+		+	+	+	+	+	
52 *H. leratii*				++						
53 *H. rufescens*									++	
54 *H. pallidum*		+	+	+	+	+	+	+		
55 *H. acutum*		+								
subgen. Myrmecostylum										
56 *H. sanguinolentum*									++	

Table 1. (Continued)

	Caroline Isls.	Solomon Isls.	Vanuatu	New Caledonia	Fiji	Samoa	French Polynesia	Australia	New Zealand	Hawaii
57 *H. villosum*									++	
58 *H. scabrium*									++	
59 *H. paniense*				++						
60 *H. humboldtianum*				++						
subgen. Fuciformia										
61 *H. pulcherrimum*									++	
subgen. Diplooephyllum										
62 *H. dilatatum*									++	
subgen. Cardiomanes										
63 *H. nephrophyllum*									++	

+: present; ++: endemic

Type: Gray & Williams 231 (Australia, Tasmania, Mt. King William range) [HO*; BRI* MEL* NSW*].

Apteropteris malingii auct. non (Hook.) Copel.: Tindale, Contr. New South Wales Natl. Herb., Fl. Ser. **201**: 6 (1963).

Distribution: Australia (Tasmania, endemic).

Chromosome number: unknown.

Note: This Tasmanian species was separated from *H. malingii* based on the definite laminar wings and often protruding receptacles by Gray and Williams (1979).

29. **Hymenophyllum subobtusum** Rosenst., Spec. Nov. Regni Veg. **9**: 71 (1910). [Fig. 3]

— *Sphaerocionium subobtusum* (Rosesnt.) Copel., Philipp. J. Sci. **67**: 34 (1938).

Type: Franc 1421 (New Caledonia, Mt. Tao, 800 m) [S*; P UC* US*].

Distribution: New Caledonia (endemic).

Chromosome number: unknown.

Note: This species is known from only a small number of collections from northern New Caledonia.

30. **Hymenophyllum frankliniae** Colenso, Tasman. J. Nat. Sci. **1**: 378 (1841). [Fig. 4]

— *Sphaerocionium frankliniae* (Colenso) K. Iwats., J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. **13**: 213 (1982).

Type: Colenso s.n., Dec. 1841 (New Zealand, North Island, Waikare Lake) [WELT; K].

Hymenophyllum franklinianum Colenso, Tasman. J. Nat. Sci. **2**: 183 (1846) — *Hymenophyllum aeruginosum* (Poir.) Carmich. var. *franklinianum* (Colenso) Hook., Sp. Fil. **1**: 94 (1844).

Type: same as *H. frankliniae*.

Hymenophyllum ferrugineum auct. non Colla: Brownsey and Smith-Dodsworth, New Zealand Ferns and Allied Plants 71 (1989).

Hymenophyllum subtilissimum auct. non Kunze: Dobbie, N. Z. Ferns 2nd ed. 48 (1921).

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie, 1958, New Zealand).

Note: *Hymenophyllum ferrugineum* was previ-

ously regarded as an example of the biogeographical connection between the South Pacific and South America, but molecular data demonstrate that the species itself is polyphyletic (Ebihara *et al.*, 2004), and support the taxonomic treatment by Iwatsuki (1982). Since *H. ferrugineum* was originally described from a specimen collected in Chile, the proper name for New Zealand "*H. ferrugineum*" is *H. frankliniae*.

31. **Hymenophyllum lyallii** Hook. f., Fl. N. Z. **2**: 16 (1855). [Fig. 5]

— *Trichomanes lyallii* (Hook. f.) Hook., Syn. Fil. (Hooker & Baker) 77 (1867) — *Sphaerocionium lyallii* (Hook. f.) Copel., Phil. J. Sci. **67**: 33 (1938).

Type: Lyall s.n., Mar. 1851 (New Zealand, South Island, Thomson's Sound) [K].

Trichomanes calvescens Bosch, Ned. Kruidk. Arch. **5**(3): 199 (1863) — *Trichomanes digitatum* Sw. var. *calvescens* (Bosch) Domin, Biblioth. Bot. **20**(85): 13 (1913).

Type: Vicary s.n., 1836–37 (Australia, NSW ("Nova Hollandia orientalis")) [L*; B* K].

Trichomanes lyallii Hook. f. var. *neocaledonicum* C. Chr., Vierteljahrsschr. Naturf. Ges. Zurich **74**: 56 (1929).

Type: Franc s.n. (New Caledonia, Mt. Mou) [BM*].

Trichomanes francii auct. non H. Christ: Brownlie, Fl. Nouvelle Caledonie & Depend. **3**: 104 (1969).

Trichomanes digitatum auct. non Sw.: Compton, J. Linn. Soc., Bot. **45**: 438 (1922).

Distribution: New Caledonia, Australia (NSW), New Zealand.

Chromosome number: $n=36$ (Brownlie in Fabbri, 1963, Brownlie, 1965, New Zealand, Tindale and Roy, 2002, Australia).

Note: There seems to be a cline in the nature of hair character; see Ebihara *et al.* (2004).

32. **Hymenophyllum digitatum** (Sw.) Fosberg, Smithsonian Contr. Bot. **45**: 1 (1980). [Fig. 6]

— *Trichomanes digitatum* Sw., Syn. Fil. 370, 422 (1806) — *Microtrichomanes digitatum* (Sw.) Copel., Philipp. J. Sci. **67**: 36 (1938) — *Crepidomanes digitatum* (Sw.) K. Iwats., Acta Phytotax. Geobot. **35**: 175 (1984).

Type: coll. unknown ("Ins. Franciae"=Mauritius) [S?*].

Trichomanes flabellatum Bosch, Ned. Kruidk. Arch. **4**: 353 (1859) — *Gonocormus flabellatus* (Bosch) Prantl, Hymen. 51 (1875).

Type: Blume s.n. (Java) [L*; P*].

Trichomanes taeniatum Copel., Bernice P. Bishop Mus. Bull. **93**: 6, pl. 2 (1932) — *Microtrichomanes taeniatum* (Copel.) Philipp. J. Sci. **67**: 37 (1938).

Type: Grant 3561, May 13, 1930 (Tahiti, Pare Fautaua, 3225 ft) [BISH*; BO* K MICH* NY* P UC* US*].

Distribution: Solomon Isls., Vanuatu, Cook Isls., French Polynesia (Society Isls., Marquesas Isls.), Australia (QLD), Continental Africa to Polynesia.

Chromosome number: $n=36$, 72 (Braithwaite, 1975, Vanuatu).

Note: This dwarf species shows a wide distribution; cytotypic variation was reported by Braithwaite (1975).

33. **Hymenophyllum tomaniiviense** (Brownlie) Ebihara et K. Iwats., Taxon **53**: 943 (2004). [Fig. 7]

— *Trichomanes tomaniiviense* Brownlie, Beih. Nova Hedw. **55**: 99, Pl. IX (1977).

Type: Brownlie 1776 (Fiji, Mt. Victoria (Tomaniivi)) [?].

Distribution: Vanuatu, Fiji.

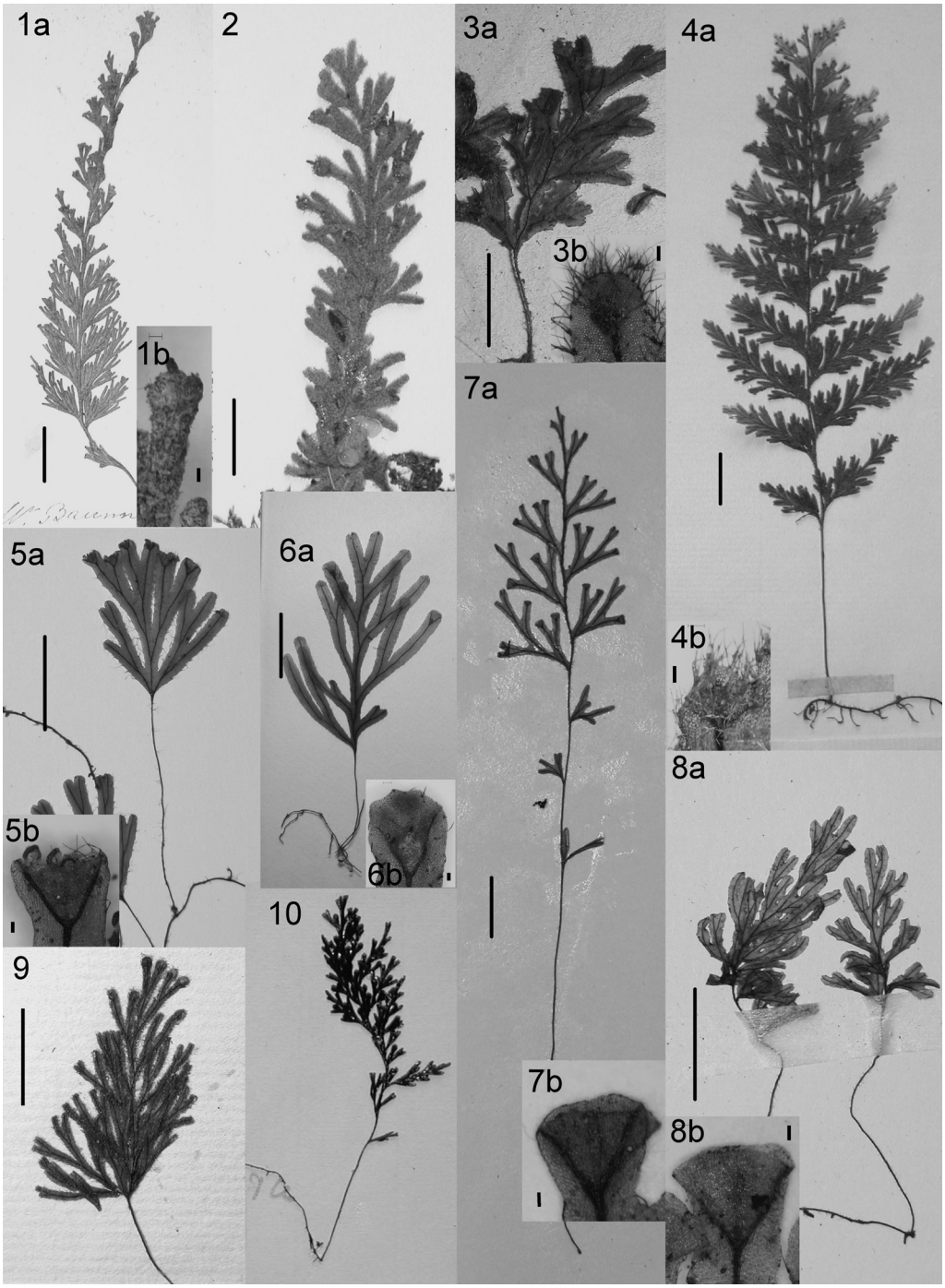
Chromosome number: $n=36$ (Braithwaite, 1975, Fiji).

34. **Hymenophyllum braithwaitei** Ebihara et K. Iwats., Taxon **53**: 943 (2004). [Fig. 8]

Type: Braithwaite & Grimes RSNH 2136B, Jul. 21, 1971 (Vanuatu, Aneityum, South slope of Inrero, southern ridge, 2450 ft.) [K].

Distribution: Vanuatu, New Caledonia.

Chromosome number: $n=36$, c. 36 (Braithwaite, 1975, Vanuatu).



Figs. 1–10. 1a–b. *Hymenophyllum malingii* (a. Maling s.n. [K, lectotype]; b. Ebihara 011222-10 [TNS]). 2. *H. applanatum* (Chinnock P996 [K]). 3a–b. *H. subobtusum* (a. Franc 1421 [P; isotype]; b. Ebihara 001224-01 [TI]). 4a–b. *H. frankliniae* (a. Colenso s.n. [K; isotype]; b. Ebihara 011216-04 [TNS]). 5a–b. *H. lyallii* (Ebihara 011217-03 [TI]). 6a–b. *H. digitatum* (a. Braithwaite RSNH 2284 [K]; b. Matsumoto 01-948 [TNS]). 7a–b. *H. tomaniiviense* (Braithwaite 654 [K]). 8a–b. *H. braithwaitei* (Iwashina 3219 [TNS]). 9. *H. lanceolatum* (Douglas 39 [K, isotype]). 10. *H. obtusum* (Beechey s.n. [K, holotype]). Scale = 1 cm for whole leaves, and 0.4 mm for sori.

35. **Hymenophyllum lanceolatum** Hook. et Arn., Bot. Beechey Voy. 109 (1832). [Fig. 9]

— *Sphaerocionium lanceolatum* (Hook. et Arn.) Copel., Philipp. J. Sci. **67**: 33 (1938).

Type: Beechey s.n. (Hawaii, Oahu) [?; K].

Distribution: Hawaii (endemic).

Chromosome number: unknown.

36. **Hymenophyllum obtusum** Hook. et Arn., Bot. Beechey Voy. 109 (1832). [Fig. 10]

— *Sphaerocionium obtusum* (Hook. et Arn.) Copel., Philipp. J. Sci. **67**: 33 (1938) — *Trichomanes obtusum* (Hook. et Arn.) C. V. Morton, Contr. U. S. Natl. Herb. **38**: 188 (1968).

Type: Beechey s.n. (Hawaii, Oahu) [K].

Distribution: Hawaii (endemic).

Chromosome number: unknown.

Subgenus 3. Mecodium C. Presl ex Copel.

37. **Hymenophyllum polyanthos** (Sw.) Sw., J. Bot. (Schrader) **1800**(2): 102 (1801). [Fig. 11]

— *Trichomanes polyanthos* Sw., Prodr. 137 (1788) — *Mecodium polyanthos* (Sw.) Copel., Philipp. J. Sci. **67**: 19 (1938).

Type: Swartz s.n. (Jamaica) [S*; BM*].

Hymenophyllum cuneatum Kunze var. *calyciforme* E. D. Br., Bernice P. Bishop Mus. Bull. **89**: 11 (1931).

Type: Brown 536, Jul. 15, 1921 (Marquesas, Nukuhiva, Tovii, 1000 m) [BISH?].

Hymenophyllum gracilius Copel., Bernice P. Bishop Mus. Bull. **93**: 7, pl. 3 (1932).

Type: Grant 3766 (Tahiti, ridge to Aorai, 1750 m) [BISH?].

Hymenophyllum epiphyticum J. W. Moore, Bernice P. Bishop Mus. Bull. **102**: 5 (1933).

Type: Moore 550, Jan. 20, 1927 (French Polynesia, Raiatea, mountain, north side of Faaroa Bay) [BISH*?].

Mecodium diversilabium Copel., Occas. Pap. Bernice P. Bishop Mus. **14**: 49, pl. 2 (1938).

Type: St. John 16438, Aug. 20, 1934 (Austral Isl., Tubuai, Taitaa, 375 m) [BISH?; K US].

Mecodium contiguum D. A. Sm., N. Queensland Naturalist **14**(80): 4 (1946) — *Hymenophyllum contiguum* (D. A. Sm.) Tindale, Contr. New South Wales Natl. Herb., Fl. Ser. **201**: 23 (1963) — *Hymenophyllum polyanthos* (Sw.) Sw. var. *contiguum* (D. A. Sm.) Croxall, Austral. J. Bot. **23**: 521 (1975).

Type: Brass 2048, May 2, 1932 (Australia, Queensland, Cook District, Mossman River Gorge) [BRI*; MEL* MICH*].

Hymenophyllum cuneatum auct. non Kunze: E. D. Brown, Bernice P. Bishop Mus. Bull. **89**: 11 (1931).

Distribution: Solomon Isls., Vanuatu, Fiji, Samoa, French Polynesia, Australia (QLD); pantropic.

Chromosome number: $n=28$ (Braithwaite, 1975; Vanuatu, Fiji, Marquesas).

Note: Hennequin *et al.* (2006) suggested not only a polyphyletic origin of Copeland's genus *Mecodium* but also polyphyly of *H. polyanthos*, the type species of *Mecodium* itself. Presently recognized "*H. polyanthos*" probably includes a number of distant lineages that did not evolve any specialized morphology within the subgenus *Mecodium*. As far as we have investigated, Pacific "*H. polyanthos*" forms a distinct clade from Neotropical (including the type locality, Jamaica) and East Asian plants (Hennequin *et al.*, 2006; Ebihara, unpublished data). Therefore, the name of the Pacific plants will need to be changed pending future comprehensive study.

38. **Hymenophyllum mnioides** Baker, Syn. Fil. (Hooker & Baker) 57 (1867). [Fig. 12]

— *Mecodium mnioides* (Baker) Copel., Philipp. J. Sci. **67**: 22 (1938)

Type: Deplanche 1, Jul. 23, 1863 (New Caledonia, "Mt. Mu"=Mt. Mou) [K].

Hymenophyllum mnioides Baker f. *amplior* Compton, J. Linn. Soc. Bot. **45**: 437 (1922).

Syntypes: Compton 1634, 1681 (New Caledonia, Ignambi, 300 ft.) [?]; Deplanche 1 p.p., (New Caledonia, summit of Mt. Mou, 1260 m) [K?]; Balansa 2702 (New Caledonia, Mt. Mou, 1150 m) [?].

Distribution: New Caledonia (endemic).

Chromosome number: unknown.

Note: An easily recognizable dwarf species

with overlapping pinnae.

39. **Hymenophyllum rarum** R. Br., Prodr. Fl. Nov. Holland. 159 (1810). [Fig. 13]

— *Mecodium rarum* (R. Br.) Copel., Philipp. J. Sci. **67**: 21 (1938).

Lectotype: Brown Iter Austral. 97, 1802–05 (Australia, Tasmania, Derwent) [BM; K MEL* NY*] designated by Tindale (1963).

Hymenophyllum semibivalve Hook. et Grev., Icon. Filic. **1**: t. 83 (1828).

Type: Menzies s.n. (New Zealand) [K].

Hymenophyllum imbricatum Colenso, Tasman. J. Nat. Sci. **2**: 187 (1846), non Blume.

Syntypes: Colenso s.n., 1842 (New Zealand, North Island, Pataua, near Wangarei) [WELT; K?*]; Colenso s.n., 1840 (New Zealand, North Island, between Wangarei and the Bay of Islands) [?].

Hymenophyllum gunnii Bosch ex Baker, Syn. Fil. (Hooker & Baker, ed. 2) 463 (1874).

Type: Gunn s.n. ("Van Diemen's Land"=Australia, Tasmania) [K; US*].

Distribution: Australia (NSW, VIC and TAS), New Zealand.

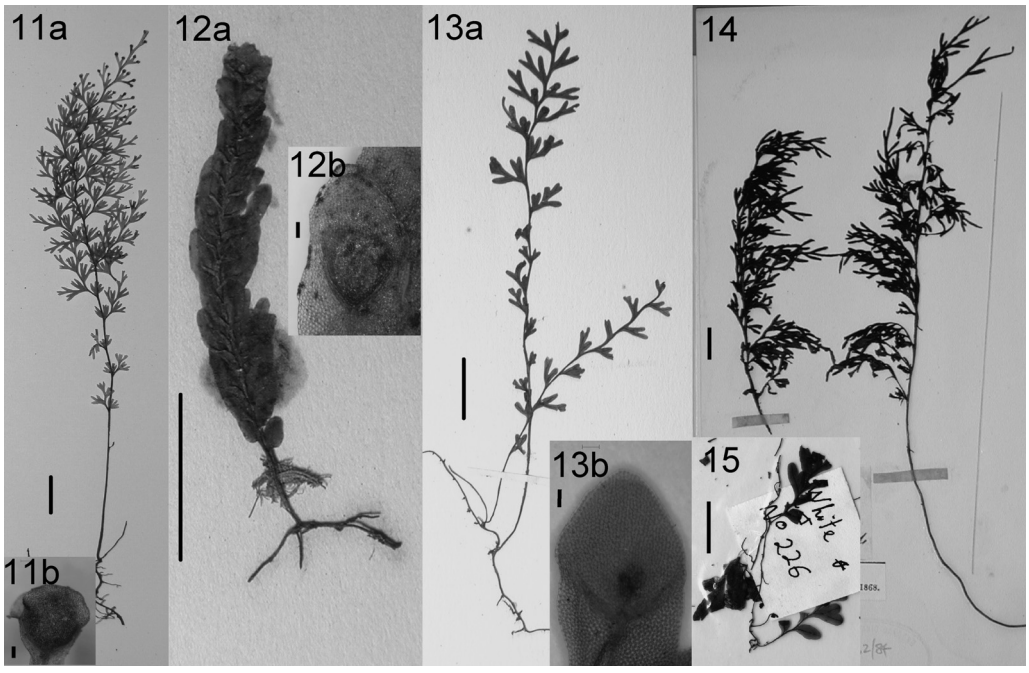
Chromosome number: $n=36$ (Brownlie, 1954, New Zealand); $n=56–58$ (Tindale and Roy, 2002, Australia); $n=58$ (Tindale and Roy, 2002, Australia).

Note: This species is distinguishable from *H. polyanthos* by its narrowly elliptic fronds. Its chromosome count of $n=36$ (Brownlie, 1954) is exceptional for subgenus *Mecodium*, and is thus doubtful.

40. **Hymenophyllum whitei** Goy, Queensland Naturalist **11**: 127 (1941). [Fig. 15]

— *Mecodium whitei* (Goy) N. A. Wakef., Victorian Naturalist **66**: 59 (1949).

Type: White & Brass 226, Sept. 19, 1937 (Australia, Queensland, Thornton Peak) [BRI*; MEL* NSW].



Figs. 11–15. 11a–b. *Hymenophyllum polyanthos* (Matsumoto 01-721 [TNS]). 12a–b. *H. mnioides* (a. Deplanche 1 [K; isotype]; b. Ebihara 001228-03 [TNS]). 13a–b. *H. rarum* (a. Brown Iter Austral. 97 [BM; holotype]; b. Ebihara 011218-02 [TNS]). 14. *H. recurvum* (Gaudichaud-Beaupre s.n. [K, isotype]). 15. *H. whitei* (White & Brass 226 [NSW, isotype]). Scale=1 cm for whole leaves, and 0.4 mm for sori.

Distribution: Australia (QLD) (endemic).

Chromosome number: unknown.

Note: *Hymenophyllum polyanthos*, *H. mnioides*, *H. rarum*, and *H. whitei* display partially overlapping geographical ranges, such that no more than two species of the four coexist in a given region. *H. whitei* is restricted to southern Queensland, and is morphologically close to *H. rarum*.

41. **Hymenophyllum recurvum** Gaudich., Voy. Uranie, Bot. 376 (1827). [Fig. 14]

—*Mecodium recurvum* (Gaudich.) Copel., Philipp. J. Sci. **67**: 20 (1938).

Type: Gaudichaud-Beaupre s.n., 1823 ("Ins Sandwich"=Hawaii) [K].

Distribution: Hawaii (endemic).

Chromosome number: unknown.

Note: This is a large species with fronds often more than 30 cm long.

Subgenus 4. Globosa (Prantl) Ebihara et K. Iwats.

42. **Hymenophyllum demissum** (G. Forst.) Sw., J. Bot. (Schrader) **1800**(2): 100 (1801). [Fig. 16]

—*Trichomanes demissum* G. Forst., Fl. Ins. Austr. **85** (1786)—*Sphaerocionium demissum* (G. Forst.) C. Presl, Hymenophyllaceae 35 (1843)—*Mecodium demissum* (G. Forst.) Copel., Philipp. J. Sci. **67**: 24 (1938).

Type: Forster Herb. 305 (locality unknown) [BM*, see Nicolson and Fosberg (2004)].

Hymenophyllum aucklandicum Bosch, Ned. Kruidk. Arch. **4**: 393 (1859)—*Hymenophyllum australe* Willd. var. *aucklandicum* (Bosch) C. Chr., Ind. Filic. 357 (1905).

Type: Hooker 6 ("Hab. Tasmania! Ins. Auckland!") [MICH*].

Hymenophyllum erecto-alatum Colenso, Trans. & Proc. New Zealand Inst. **11**: 431 (1879).

Syntypes: Colenso s.n., 1876 and 1878 (New Zealand, North Island, Hawke Bay, near Norsewood) [WELT; K?].

Hymenophyllum megalocarpum Colenso, Trans. & Proc. New Zealand Inst. **15**: 308 (1883).

Syntypes: Kirk?, 1881 and 1882 (New Zealand, North Island, Seventy-mile Bush between Norsewood and Danneverke) [WELT; K?].

Hymenophyllum polychilum Colenso, Trans. & Proc. New Zealand Inst. **24**: 395 (1892).

Type: Colenso s.n., 1890–91 (New Zealand, North Island, County of Waipawa, south of Dannevirke) [WELT; K].

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie, 1954, 1958, New Zealand).

Note: Hennequin *et al.* (2006) suggested a sister relationship of this and *H. badium*. Cockayne and Allan (1934) report a hybrid between this and *H. scabrum*, but this is highly doubtful because of the genetic distance between the two.

43. **Hymenophyllum imbricatum** Blume, Enum. Pl. Javae 220 (1828). [Fig. 17]

—*Mecodium imbricatum* (Blume) Copel., Philipp. J. Sci. **67**: 22 (1938).

Type: Blume s.n. (Java) [L*].

Hymenophyllum formosum Brack., U.S. Expl. Exped., Filic. **16**: 268, t. 37, fig. 3 (1854).

Type: Wilkes (Brackenridge) s.n. (Society Isls., mountain forest of Tahiti) [US; GH K NY].

Hymenophyllum dilatatum auct. non (G. Forst.) Sw.: E. Fourn., Ann. Sci. Nat. V **18**: 267 (1873).

Hymenophyllum emarginatum auct. non Sw.: E. Fourn., Ann. Sci. Nat. V **18**: 266 (1873).

Distribution: Solomon Isls., Vanuatu, New Caledonia, Fiji, Samoa, French Polynesia (Society Isls.), Malesia to Polynesia.

Chromosome number: $n=36$ (Braithwaite, 1969, Solomon Isls.; Braithwaite, 1975, Vanuatu).

Note: This is one of the most common species of *Hymenophyllum* in the South Pacific, and is characterized by its broad involucres.

44. **Hymenophyllum junghuhnii** Bosch, Pl. Jungh. **1**: 570 (1856).

—*Mecodium junghuhnii* (Bosch) Copel., Philipp. J. Sci. **67**: 22 (1938).

Type: Junghuhn s.n. (Java) [L].

Hymenophyllum bamlerianum auct. non Rosenst.: Ebihara *et al.*, Ann. Tsukuba Bot. Gard. **21**: 63 (2002).

Distribution: Solomon Isls., Vanuatu, Malesia.

Chromosome number: $n=36$ (Braithwaite, 1969, Solomon Isls.; Braithwaite, 1975, Vanuatu).

Note: This species, clearly related to Malesian taxa based on morphology, generally resembles *H. imbricatum*, but is characterized by broader, waved wings of the rachis and stipes. The name "*H. bamlerianum*" has been formerly applied to this species, but is probably a synonym of *H. imbricatum*, and therefore should not be used.

45. **Hymenophyllum reinwardtii** Bosch, Pl. Jungh. **1**: 567 (1853). [Fig. 19]

— *Hymenophyllum dichotomum* Blume, Enum. Pl. Javae. 222 (1828), non Cav. — *Mecodium reinwardtii* (Bosch) Copel., Philipp. J. Sci. **67**: 20 (1938).

Distribution: Caroline Isls., Malesia.

Note: The undulate margins of lamina of this species are similar to those of *H. javanicum*, but the involucres are orbicular as in *H. reinwardtii*.

46. **Hymenophyllum australe** Willd., Sp. Pl. (ed. 4) **5**: 527 (1810). [Fig. 22]

— *Mecodium australe* (Willd.) Copel., Philipp. J. Sci. **67**: 24 (1938) — *Sphaerocionium australe* (Willd.) C. Presl, Hymenophyllaceae 35 (1843).

Type: Labillardiere, Herb. Willdenow 20232 ("Nova Hollandia"=Tasmania, Australia) [B*].

Hymenophyllum atrovirens Colenso, Tasman. J. Nat. Sci. **2**: 186 (1846) — *Hymenophyllum javanicum* A. Spreng. var. *atrovirens* (Colesno) Hook. et Baker, Syn. Fil. (Hooker & Baker, ed. 2) 60 (1874) — *Hymenophyllum australe* Willd. var. *atrovirens* (Colenso) C. Chr., Index Filic. 357 (1905) — *Mecodium atrovirens* (Colenso) Copel., Philipp. J. Sci. **73**: 457 (1941).

Type: Colenso s.n., Dec. 1841 (New Zealand, North Island, shores of Waikare Lake) [WELT; K*].

Hymenophyllum tasmannicum Bosch, Ned. Kruidk. Arch. **4**: 399 (1859).

Type: Brown s.n. ("van Diemensland"=Australia, Tasmania) [L?; K].

Hymenophyllum intricatum Bosch, Ned. Kruidk. Arch. **5**(3): 168 (1863) — *Mecodium intricatum* (Bosch) Copel., Philipp. J. Sci. **67**: 22 (1938).

Type: Gunn s.n. ("van Diemensland"=Australia, Tasmania, St. Patrick River) [L*; K].

Hymenophyllum montanum Kirk, Trans. & Proc. New Zealand Inst. **10**: 394, t. 21B, (1878) — *Mecodium montanum* (Kirk) Copel., Philipp. J. Sci. **67**: 22 (1938).

Type: Mason s.n. (New Zealand, South Island, on mounains at the head of Lake Wakatipu) [K?; GH* WELT].

Hymenophyllum neozelandicum Gand., Bull. Soc. Bot. France **60**: 29 (1913).

Type: Astor s.n. (New Zealand) [?].

Hymenophyllum javanicum auct. non A. Spreng.: G. Bentham, Fl. Austral. **7**: 705, 1878.

Distribution: Australia (QLD, NSW, VIC and TAS), New Zealand.

Chromosome number: $n=36$ (Vessey and Barlow, 1963, Australia; Brownlie in Fabbri, 1963, Brownlie, 1965, New Zealand); $n=72$I (Tindale and Roy, 2002, Australia).

Note: This species has frond margins two cells thick. New Zealand forms have a slightly rigid texture and are sometimes distinguished as *H. atrovirens*, but are reduced to *H. australe* here.

47. **Hymenophyllum javanicum** A. Spreng., Syst. Veg. (ed. 16) **4**: 132 (1827). [Fig. 21]

— *Mecodium javanicum* (A. Spreng.) Copel., Philipp. J. Sci. **67**: 20 (1938).

Type: Nees s.n. (Java) [L*].

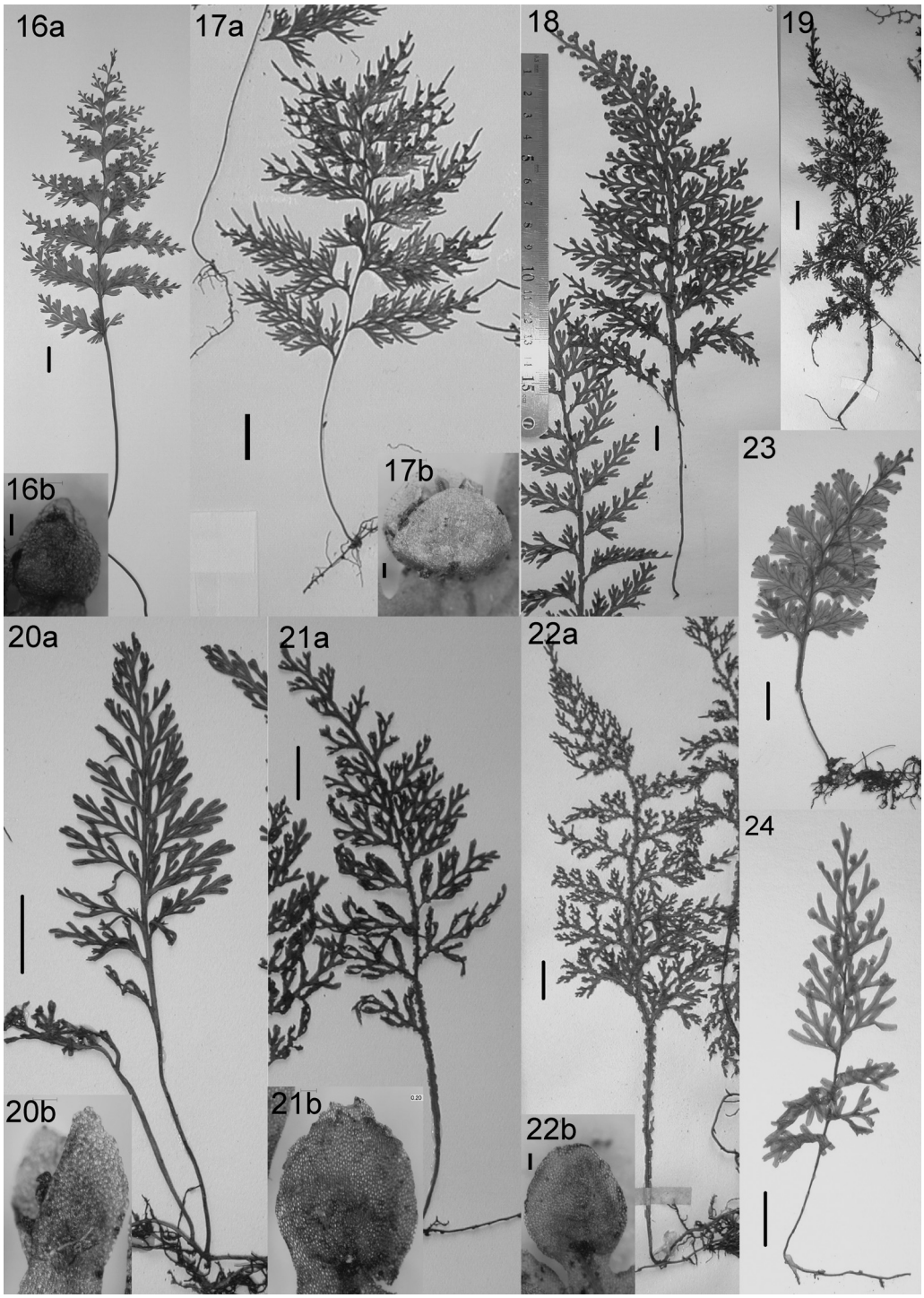
Hymenophyllum crispum Nees et Blume, Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. **11**: 128, t. 14, f. 1 (1823), non Kunth.

Type: same as that of *H. javanicum*.

Hymenophyllum streptophyllum E. Fourn., Ann. Sci. Nat., Bot. V **18**: 266 (1873).

Type: Balansa 2708 (New Caledonia, La Conception, 550 m) [P].

Hymenophyllum crispatum Wall. ex Hook. et



Figs. 16–24. 16a–b. *Hymenophyllum demissum* (Ebihara 011218-08 [TNS]). 17a–b. *H. imbricatum* (a. Braithwate RSNH 2044 [K]; b. Matsumoto 01-758 [TI]). 18. *H. junghuhnii* (Braithwaite RSNH 2400 [K]). 19. *H. reinwardtii* (Ledermann s.n. [K]). 20a–b. *H. australe* (a. Croxall & Parris 1399 [K]; b. Ohsawa 001125-03 [TNS]). 21a–b. *H. javanicum* (a. Croxall & Parris 3244 [K]; b. Ebihara 010909-01 [TNS]). 22a–b. *H. flexuosum* (a. Cunningham 238 [K; holotype]; b. Ebihara 011222-12 [TNS]). 23. *H. eboracense* (Brass 19876 [K; isotype]). 24. *H. angulosum* (Braithwaite RSS 4284 [K]). Scale＝1 cm for whole leaves, and 0.4 mm for sori.

Grev. var. *minus* Hook. in E. Fourn., Ann. Sci. Nat., Bot. V **18**: 267 (1873).

Type: Balansa 2708a p.p. (New Caledonia, Mt. Mou) [P?*].

Hymenophyllum samoense Baker, J. Bot. **14**: 10 (1876) — *Mecodium samoense* (Baker) Copel., Philipp. J. Sci. **67**: 23 (1938).

Syntypes: Whitmee 12, 14, Aug. 1875 (Samoa) [K; BM E?* GH*]. There is an annotation as the lectotype on the sheet of Whitmee 12 (K) by Croxall dated 1975, but apparently his designation has not yet been published.

Hymenophyllum shirleyanum Domin, Biblioth. Bot. **20**(85): 22, t. I, fig. 1; t. II, fig. 1 (1913).

Type: Domin, Iter Austral. 36 (Australia, Queensland, Mt. Bellenden Ker) [PR*].

Hymenophyllum productoides J. W. Moore, Bernice P. Bishop Mus. Bull. **102**: 5 (1933).

Type: Moore 660, Mar. 5, 1927 (French Polynesia, Raiatea, south end of Opoa Mountain) [BISH].

Hymenophyllum australe auct. non Willd.: E. Fourn., Ann. Sci. Nat., Bot. V **18**: 267 (1873).

Hymenophyllum fimbriatum auct. non J. Sm.: E. Fourn., Ann. Sci. Nat., Bot. V **18**: 267 (1873).

Distribution: Vanuatu, New Caledonia, Tahiti, Fiji, French Polynesia (Society Isls., Marquesas Isls.), Australia (QLD), Taiwan and South Asia to Malesia.

Chromosome number: $n=36$ (Vessey and Barlow, 1963, Australia; Braithwaite, 1975, Fiji).

Note: This species is characterized by crisped laminar margins and subdeltoid involucres with more or less serrate lips. *Hymenophyllum samoense* with slightly serrate frond margins is often difficult to distinguish and is here synonymized with *H. javanicum*. *Hymenophyllum streptophyllum* of New Caledonia is undoubtedly in the range of morphological variation of this species.

48. **Hymenophyllum flexuosum** A. Cunn. in Hook., Companion Bot. Mag. **2**: 369 (1836). [Fig. 22]

— *Hymenophyllum australe* Willd. var. *flexuosum* (A. Cunn.) C. Chr., Index Filic. 361 (1905) — *Mecodium flexuosum* (A. Cunn.) Copel., Philipp. J. Sci. **67**: 24 (1938).

Type: Cunningham 238, 1834 (New Zealand, North Island, Wangaroa) [K].

Hymenophyllum australe auct. non Willd.: Dobbie, N. Z. Ferns 2nd ed. 32 (1921).

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie, 1961, New Zealand).

Note: This species is easily recognizable among New Zealand species by its crisped fronds. "*H. australe*" was also applied in some earlier publications to this species.

49. **Hymenophyllum eboracense** Croxall, Austral. J. Bot. **23**: 518, fig. 1 (1975). [Fig. 23]

Type: Brass 19876, Aug. 17, 1948 (Australia, Queensland, Upper Nesbit River, Leo Creek) [BRI*; K].

Distribution: Australia (QLD) (endemic).

Chromosome number: unknown.

Note: As Croxall (1975) pointed out, this species is confined to Cape York Peninsula, and is probably related to Malesian species such as *H. junghuhnii* and *H. badium*.

50. **Hymenophyllum angulosum** H. Christ, Philipp. J. Sci., C **3**: 269 (1908). [Fig. 24]

— *Mecodium angulosum* (H. Christ) Copel., Philipp. J. Sci. **67**: 20 (1938).

Type: Merrill 6080 (Philippines, Mindoro, Mt. Halcon) [P; MICH*].

Hymenophyllum treubii auct. non Racib.: A. F. Braithw., Fern Gaz. **10**: 82 (1969).

Distribution: Solomon Isls., Vanuatu, Malesia.

Chromosome number: $n=36$ (Braithwaite, 1969, Solomon Isls.; Braithwaite, 1975, Vanuatu).

Note: *Hymenophyllum angulosum* and *H. treubii*, both described from Malesia, have similar frond forms, but can be distinguished by receptacle characters (clavate in *H. angulosum* and capitate in *H. treubii*).

Subgenus 5. Pleuromanes (C. Presl) Ebihara et K. Iwats.

51. **Hymenophyllum flabellatum** Labill., Nov. Holl. Pl. **2**: 101, t. 250, fig. 1 (1806). [Fig. 25]

— *Mecodium flabellatum* (Labill.) Copel., Philipp. J. Sci. **67**: 21 (1938).

Type: Labillardiere s.n. ("Nova Hollandia et Terra Diemen"=Australia and Tasmania) [FI*; B?* GH* K].

Hymenophyllum nitens R. Br., Prodr. Fl. Nov. Holland. 159 (1810).

Lectotype: Brown Iter Austral. 98 (Australia, Tasmania, Derwent) [BM; K MEL?*], designated by Tindale (1963).

Distribution: Vanuatu, Fiji, Samoa, French Polynesia (Society Isls., Marquesas Isls.), Australia (QLD, NSW, VIC, TAS), New Zealand, Samoa, Tahiti.

Chromosome number: $n=36$ (Brownlie, 1954, New Zealand; Manton and Sledge, 1954, Australia; Braithwaite, 1975, Vanuatu; Tindale and Roy, 2002, Australia).

Note: This is a typical Pacific species ranging over most of the area of this study, and is well characterized by the yellowish hairs covering the rhizome and fronds.

52. **Hymenophyllum leratii** Rosesnt., Repert. Spec. Nov. Regni Veg. **9**: 71 (1910). [Fig. 26]

— *Mecodium leratii* (Rosesnt.) Copel., Philipp. J. Sci. **67**: 21 (1938).

Type: Le Rat 13, Jan. 1910 (New Caledonia, monte Panié) [P; US*].

Distribution: New Caledonia (endemic).

Chromosome number: unknown.

Note: The closely related *H. flabellatum* does not occur in New Caledonia, although it is distributed widely.

53. **Hymenophyllum rufescens** Kirk, Trans. & Proc. New Zealand Inst. **11**: 457, t. 19A (1879). [Fig. 27]

— *Mecodium rufescens* (Kirk) Copel., Philipp. J. Sci. **67**: 21 (1938).

Type: Field s.n. (New Zealand, North Island, Ruahine Moutains) [?]; Hamilton s.n., June 1878 (New Zealand, South Isl., Okarito) [K].

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie in Fabbri, 1963; Brownlie, 1965, New Zealand).

Note: This species is a close relative to *H. flabellatum*, and confined to New Zealand. The morphologically intermediate form between this species and *H. flabellatum* (cf. Holloway, 1923; Cockayne and Allan, 1934) needs further study.

54. **Hymenophyllum pallidum** (Blume) Ebihara et K. Iwats., Blumea **51**: 232 (2006). [Fig. 28]

— *Trichomanes pallidum* Blume, Enum. Pl. Javae 225 (1828) — *Pleuromanes pallidum* (Blume) C. Presl, Epimel. Bot. 18, t. 9 (1849) — *Craspedoneuron pallidum* (Blume) Bosch, Verh. Kon. Akad. Kon. Wetensch., Afd. Natuurk. **9**: 14, t. 8 (1861) — *Crepidomanes pallidum* (Blume) K. Iwats., Acta Phytotax. Geobot. **35**: 174 (1984).

Type: Blume s.n. (Java) [L].

Trichomanes album Blume, Enum. Pl. Javae 226 (1828) — *Leucomanes album* (Blume) C. Presl, Epimel. Bot. 258 (1849) — *Craspedoneuron album* (Blume) Bosch, Verh. Kon. Akad. Kon. Wetensch., Afd. Natuurk. **9**: 12, t. 7 (1861) — *Pleuromanes album* (Blume) Parris, Pl. Mt. Kinabalu **1**: 87 (1992).

Type: Blume s.n. (Java) [L*; P*].

Trichomanes savaiense Lauterb., Bot. Jahrb. Syst. **41**: 218 (1908).

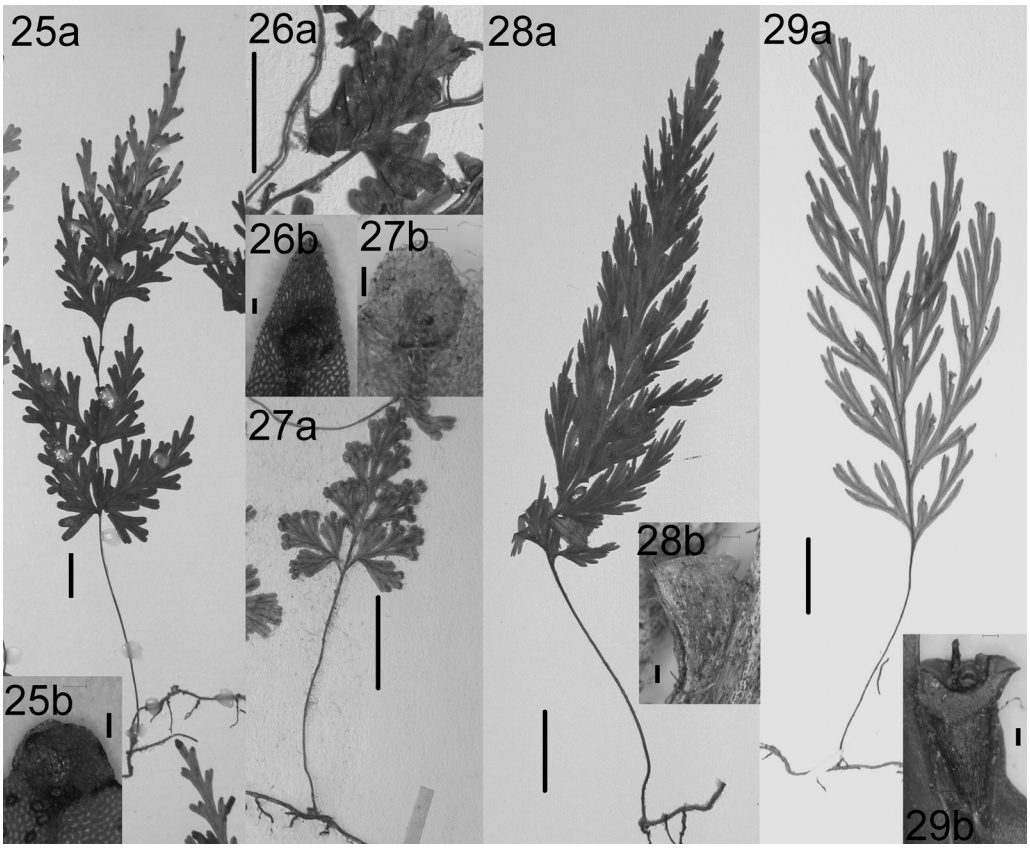
Type: Vaupel 302, June 30, 1906 (Samoa, Savaii, Südlich Maugaloa, 1200 m) [B?].

Distribution: Solomon Isls., Vanuatu, New Caledonia, Fiji, Samoa, French Polynesia (Society Isls., Marquesas Isls.), Australia (QLD), from Taiwan, Sri Lanka to Polynesia.

Chromosome number: $n=36$, c. 36 (Braithwaite, 1969, Solomon Isls.).

Molecular Data: available (New Caledonia; Malaysia).

Note: This and the following species were formerly members of the genus *Pleuromanes*, characterized by glaucous fronds, and have been considered as members of *Trichomanes* s.l., specifically as being related to *Vandenboschia* (Copeland, 1933).



Figs. 25–29. 25a–b. *Hymenophyllum flabellatum* (Brownlie 1346 [K]). 26a–b. *H. leratii* (a. Le Rat 13 [P, holotype]; b. Rosenstock Fil. N.C. exsicc. 64 [KYO]). 27a–b. *H. rufescens* (a. Kirk 969 [K]; b. Ebihara 011221-08 [TNS]). 28a–b. *H. pallidum* (Ebihara 001228-01 [TNS]). 29a–b. *H. acutum* (Braithwaite RSS 4740 [BM]). Scale = 1 cm for whole leaves, and 0.4 mm for sori.

55. **Hymenophyllum acutum** (C. Presl) Ebihara et K. Iwats., Blumea **51**: 232 (2006). [Fig. 29]

— *Trichomanes acutum* C. Presl, Hymenophyllaceae 42 (1843) — *Pleuromanes acutum* (C. Presl) C. Presl, Epimel. Bot. 258 (1849) — *Crepidomanes acutum* (C. Presl) K. Iwats., Acta Phytotax. Geobot. **35**: 174 (1984).

Type: Cuming 219 (Philippines) [PRC*; GH* L* P*].

Distribution: Solomon Isls., New Guinea, Philippines.

Chromosome number: unknown.

Note: This species resembles the preceding one, and is distinguished by its narrower fronds and less hairy lamina. Further study is necessary to accurately delimit this species.

Subgenus 6. Myrmecostylum (C. Presl) Ebihara et K. Iwats.

56. **Hymenophyllum sanguinolentum** (G. Forst.) Sw., J. Bot. (Schrader) **1800**(2): 101 (1801). [Fig. 30]

— *Trichomanes sanguinolentum* G. Forst., Fl. Ins. Austr. 84 (1786) — *Sphaerocionium sanguinolentum* (G. Forst.) C. Presl, Hymenophyllaceae 35 (1843) — *Hymenophyllum polyanthos* (Sw.) Sw. var. *sanguinolentum* (G. Forst.) Hook. in Hook. f., Fl. N. Z. **2**: 14 (1855) — *Mecodium sanguinolentum* (G. Forst.) Copel., Philipp. J. Sci. **67**: 17 (1938).

Type: Forster Herb. 303 (New Zealand) [BM*, see Nicolson and Fosberg (2004)].

Hymenophyllum lophocarpum Colenso, Trans.

& Proc. New Zealand Inst. **17**: 255 (1885) — *Hymenophyllum sanguinolentum* (G. Forst.) Sw. var. *lophocarpum* (Colenso) Domin, Biblioth. Bot. **20**(85): 24 (1913).

Type: Colenso s.n. (New Zealand, North Island, County of Waipawa, near Norsewood) [K].

Hymenophyllum cristulatum Rosenst., Repert. Spec. Nov. Regni Veg. **5**: 14 (1908).

Type: Ranft 1, Rosenstock Filices Novae-Zealaniae Exsicc. No. 11 (New Zealand, South Island, Nelson, Wahi Punamu) [?; BM K MICH* UC*].

Hymenophyllum polyanthos auct. non (Sw.) Sw.: Hook., Sp. Fil. **1**: 107 p.p.

Distribution: New Zealand (endemic).

Chromosome number: $n=34$ (Daellenbach, 1982); $n=$c.34 (Daellenbach, 1982); $n=36$ (Bronwlie, 1954, 1961; Daellenbach, 1982); $n=66$–70 (Daellenbach, 1982); $n=68$ (Daellenbach, 1982); $n=$c. 68 (Daellenbach, 1982); $n=72$ (Brownlie, 1954, 1961; Daellenbach, 1982). All materials are from New Zealand.

Note: This species is highly similar to *H. polyanthos* in appearance, but can be distinguished by the scent of the fronds.

57. **Hymenophyllum villosum** Colenso, Tasman. J. Nat. Sci. **2**: 185 (1846). [Fig. 31]

— *Mecodium villosum* (Colenso) Copel., Philipp. J. Sci. **67**: 24 (1938).

Type: Colenso [288], Jan. 1842 (New Zealand, North Island, near Ruatahuna) [WELT; K].

Distribution: New Zealand (endemic).

Chromosome number: $n=34$ (Daellenbach, 1982, New Zealand); $n=$c.34 (Daellenbach, 1982, New Zealand); $n=36$ (Brownlie, 1954, New Zealand).

Note: This species is distinguished from the preceding one by its hairy axis, although a morphologically intermediate form has been found (Cockayne and Allan, 1934). Lovis in Dawson *et al.* (2000) also demonstrated the existence of hybrids between the two species based on cytological data.

58. **Hymenophyllum scabrum** A. Rich., Fl. N. Zeal. 90, t. 14, fig. 1 (1832). [Fig. 32]

— *Sphaerocionium scabrum* (A. Rich.) C. Presl, Hymenophyllaceae 34 (1843) — *Diploöphyllum scabrum* (A. Rich.) Bosch, Verslagen Meded. Afd. Natuurk. Kon. Akad. Wetensch. **11**: 323 (1861) — *Mecodium scabrum* (A. Rich.) Copel., Philipp. J. Sci. **67**: 24 (1938).

Type: D'Urville s.n. (New Zealand) [P*].

Sphaerocioium glanduliferum C. Presl., Epimel. Bot. 22, t. 12 (1849).

Type: Cunningham s.n. (locality unknown) [R?].

Hymenophyllum scabrum A. Rich. var. *hirtum* Colenso, Trans. & Proc. New Zealand Inst. **13**: 379 (1881).

Type: Colenso? s.n. (New Zealand, South Island, Ruahine range) [?].

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie, 1958, New Zealand).

Note: This species is also related to the preceding two species, but has larger fronds and slightly serrate involucre lips.

59. **Hymenophyllum paniense** Ebihara et K. Iwats., Syst. Bot. **28**: 229 (2003). [Fig. 33]

Type: Ebihara 001225-02 (Mt. Panié, New Caledonia) [P; KYO NOU TI].

Distribution: New Caledonia (endemic).

Chromosome number: unknown.

Note: This is an isolated species recently described from New Caledonia (Ebihara *et al.*, 2003). Though so far known only from the sterile type collection, its impressive articulated hairs are quite characteristic.

60. **Hymenophyllum humboldtianum** E. Fourn., Ann. Sci. Nat., Bot. V **18**: 265 (1873). [Fig. 35]

Type: Balansa 1638, Oct. 12, 1869 (New Caledonia, Mt. Humboldt, 1300 m) [P].

Hymenophyllum balansae E. Fourn., Ann. Sci. Nat., Bot. V **18**: 265 (1873).

Type: Balansa 2698 (New Caledonia, Mt. Mou, 1550 m) [P].

Distribution: New Caledonia (endemic).

Chromosome number: unknown.

Note: This species is known only from limited number of collections, and its systematic position is unclear. While Ebihara *et al.* (2006) attributed this species to subgen. *Globosa*, we transferred it to subgen. *Myrmecostylum* based on the character of oils in the fronds that make an impression on mounting paper during specimen preparation (Ebihara *et al.*, 2006).

Subgenus 7. Fuciformia Ebihara et K. Iwats.

61. **Hymenophyllum pulcherrimum** Colenso, Tasman. J. Nat. Sci. **2**: 185 (1846). [Fig. 34]

—*Mecodium pulcherrimum* (Colenso) Copel., Philipp. J. Sci. **67**: 24 (1938).

Figs. 30–37. 30a–b. *Hymenophyllum sanguinolentum* (Ebihara 011223-04 [TNS]). 31a–b. *H. villosum* (a. Colenso 288 [K; isotype]; b. Ebihara 011225-01 [TNS]). 32a–b. *H. scabrum* (Ebihara 011223-05 [TNS]). 33. *H. paniense* (Ebihara 011225-02 [P; holotype]). 34a–b. *H. pulcherrimum* (a. Colenso 273 [K; isotype]; b. Ebihara 011221-03 [TNS]). 35. *H. humboldtianum* (Balansa 1830 [P]). 36a–b. *H. dilatatum* (Ebihara 011219-06 [TNS]). 37a–b. *H. nephrophyllum* (Ebihara 011222-07 [TNS]). Scale＝1 cm for whole leaves, and 0.4 mm for sori.

Type: Colenso s.n., [Dec.] 1841 (New Zealand, shores of Waikare Lake) [WELT; K].

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie, 1961, New Zealand).

Note: This subgenus is characterized by having a suberect rhizome, which is an exceptional character in *Hymenophyllum*. *Hymenophyllum fuciforme*, the other member of this subgenus, is disjunctly distributed in southern Chile.

Subgenus 8. Diploöphyllum (Bosch) Ebihara et K. Iwats.

62. **Hymenophyllum dilatatum** (G. Forst.) Sw., J. Bot. (Schrader) **1800**(2): 100 (1801). [Fig. 26]

— *Trichomanes dilatatum* G. Forst., Fl. Ins. Austr. 85 (1786) — *Sphaerocionium dilatatum* (G. Forst.) C. Presl, Hymenophyllaceae 35 (1843) — *Diploöphyllum dilatatum* (G. Forst.) Bosch, Verslagen Meded. Afd. Natuurk. Kon. Akad. Wetensch. **11**: 323 (1861) — *Mecodium dilatatum* (G. Forst.) Copel., Philipp. J. Sci. **67**: 24 (1938).

Lectotype: Forster s.n. (New Zealand) [UPS-T] designated by Fosberg in Nicolson and Fosberg (2004).

Leptocionium sororium C. Presl, Epimel. Bot. 21, t. 11 (1849).

Type: "Hb. Baro C. Hügel" (New Zealand) [PRC?]

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie, 1958, New Zealand; Sorsa in Fabbri, 1965, cult. U.S.A.).

Note: The name "*H. dilatatum*" was often misapplied to the widely ranging *H. imbricatum* in earlier publications. This is one of the most prominent species of *Hymenophyllum*, with large fronds more than 30 cm long, and lamina several cells thick (Holloway, 1944). Species having multi-layered lamina are observed in at least four subgenera of *Hymenophyllum* (subgen. *Globosa*, *Myrmecostylum*, *Diploöphyllum* and *Cardiomanes*), and the character probably evolved several times independently.

Subgenus 9. Cardiomanes (C. Presl) Ebihara et K. Iwats.

63. **Hymenophyllum nephrophyllum** Ebihara et K. Iwats., Blumea **51**: 234 (2006). [Fig. 37]

— *Trichomanes reniforme* G. Forst., Fl. Ins. Austr. 84 (1786) — *Cardiomanes reniforme* (G. Forst.) C. Presl, Hymenophyllaceae 13 (1843).

Type: Forster s.n. (locality unknown) [UPS-T*] designated by Nicolson and Fosberg (2004).

Distribution: New Zealand (endemic).

Chromosome number: $n=36$ (Brownlie, 1958, New Zealand; Sorsa in Fabbri, 1965, cult. U.S.A.).

Note: The monotypic genus *Cardiomanes,* formerly regarded as the most isolated species in Hymenophyllaceae (e.g. Iwatsuki, 1990) because of its peculiar kidney-shaped frond and several-cell-thick lamina (cf. Holloway, 1944), is now known to be a basal member of *Hymenophyllum* based on molecular data. The epithet has been renamed since an earlier name exists under the genus *Hymenophyllum*.

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