

New combinations in *Cranfillia* (Blechnaceae: Polypodiopsida) for recent segregates of the *Blechnum vulcanicum* complex

Peter J. de Lange¹ and Barbara Parris²

¹School of Environmental & Animal Sciences, Unitec Institute of Technology, Private Bag 92025, Victoria Street West, Auckland 1142

²Fern Research Foundation, 21 James Kemp Place, Kerikeri, North Auckland 0230

Corresponding author: pdelange@unitec.ac.nz

Abstract

New combinations in *Cranfillia* (Blechnaceae: Polypodiopsida) are provided for: *Blechnum aequabile* T.C.Chambers, *B. humile* T.C.Chambers, *B. megavulcanicum* T.C.Chambers, *Blechnum nukuhivense* E.D.Br., *B. phanerophlebium* Baker ex C.Chr., *B. venosum* Copel., *Blechnum vulcanicum* var. *feani* E.D.Br. (*B. feani* (E.D.Br.) T.C.Chambers), and *Blechnum vulcanicum* var. *tovii* E.D.Br. (*B. tovii* (E.D.Br.) T.C.Chambers) and *Lomaria deltooides* Colenso (*Blechnum deltooides* (Colenso) T.C.Chambers), following the generic classification accepted by the Pteridophyte Phylogeny Group.

Introduction

Chambers and Wilson (2019) revised *Blechnum vulcanicum* (Blume) Kuhn offering a narrower circumscription of that species recognising three new species and reinstating three species previously treated as synonyms of *B. vulcanicum*. In their paper the authors adopted the broad ‘traditional, inclusive view’ of the Blechnaceae because this was ‘favoured by the senior author’ (see Chambers and Wilson 2019, p. 43). Chambers and Wilson (2019) did note however, that under the classification of Gasper *et al.* (2016) their species would ‘fall into the segregate genus *Cranfillia*’.

World opinion on the segregation of the Blechnaceae is varied. In Australia, at least for now (M.A.M. Renner *pers. comm.*), consensus seems to favour recognition of a broadly circumscribed *Blechnum* (see the Australian Plant Consensus (Council of Heads of Australasian Herbaria (CHAH) 2018, accessed 19 August 2019) as advocated by Perrie *et al.* (2014) whereas elsewhere the narrower circumscription of *Blechnum* advocated by Gasper *et al.* (2016), Pteridophyte Phylogeny Group 1 [PPG 1] (2016), Gasper *et al.* (2017) and Dittrich *et al.* (2017) has been more or less adopted, e.g. Farris *et al.* (2018), Smith & Kessler (2018), da Silva *et al.* 2019; Molino *et al.* (2019), Jaman (*in press*). In New Zealand however, a consensus view has not been achieved with the New Zealand Plant Names Database *Ngā Tipu o Aotearoa* (NZPND, accessed 6 August 2019) following Perrie *et al.* (2016) in recognising only *Blechnum* whilst the New Zealand Plant Conservation Network (NZPCN, accessed 6 August 2019) accept the treatment of Gasper *et al.* (2016). Outside these websites opinions vary but there does seem to be an increasing acceptance of the narrower circumscription of *Blechnum* e.g., Wilcox and

Warden (2017), Heenan and McGlone (2019). From a New Zealand perspective then, the recent treatment of *Blechnum vulcanicum* by Chambers and Wilson (2019) leaves *Blechnum deltooides* (Colenso) T.C.Chambers without a legitimate name in *Cranfillia*. Furthermore, the revision by Chambers and Wilson (2019) also leaves five further taxa without names in *Cranfillia*. Accordingly, we provide here the necessary combinations for those who wish to follow PPG 1 (2016).

Taxonomic Treatment

Cranfillia aequabilis (T.C.Chambers) Parris et de Lange *comb. nov.*

Basionym: *Blechnum aequabile* T.C.Chambers *Telopea* 22: (47) (2019)

Type: Fiji: Vanua Levu: Mt Delaikoro, 1000 m, Apr 1962, R.G. Robbins *s.n.* (holotype: NSW 383759 *n.v.*).

= *Lomaria pilosa* Brack. *auct., pro parte, U.S. Expl. Exped.* 16: 125–6 (1854).

= *Blechnum vulcanicum* var. *rapense* E.D.Br., *Bull. Bernice P. Bishop Mus.* 89: 72 (1931)

Type (*vide* Chambers & Wilson 2019): Rapa, Feb 1922, E.H. Quayle XX (holotype: BISH 1000234 *n.v.*).

Cranfillia deltooides (Colenso) de Lange et Parris *comb. nov.*

Basionym: *Lomaria deltooides* Colenso, *Tasmanian J. Nat. Sci.* 1: 376 (1843)

Type citation: ‘In woods in Te Waiiti District, nearly same locality as preceding. January, 1842.’

Type: New Zealand: North Island: Shaded woods, Te Waiiti, Interior, Dec 1841, Colenso *s.n.* (holotype: WELT, P03239!; isotypes: [New Zealand, Colenso 290] K 001092698 *n.v.*)

= *Lomaria deflexa* Colenso, *Tasmanian J. Nat. Sci.* 2: 178 (1845) non *Lomaria deflexa* Baker, *J. Bot.* 26: 226 (1888) *nom. illeg.* (= *Blechnum deflexum* Diels).

Type citation: ‘Dry clayey banks, sides of rivers, country between Turanga and the River Wairoa, E. Coast, Dec. 1841.’

Type: New Zealand: North Island: clayey banks, country between Poverty Bay and the River Wairoa, Dec 1841, Colenso *s.n.* (holotype: WELT P03238! [in Herb Colenso]; isotype: [New Zealand, Colenso 268 (on same sheet as *Lomaria deltooides*)] K 001092697 *n.v.*).

= *Lomaria paucijuga* Colenso, *Trans. & Proc. New Zealand Inst.* 20: 222 (1888)

Type citation: ‘Sides of Mount Tongariro, County of East Taupo; 1887: Messrs. Owen & Hill’

Type: Tongariro, H. Hill *s.n.* (holotype: WELT, P03332! ex Herb. Colenso; isotype: K 001092696 *n.v.*).

Cranfillia feani (E.D.Br.) Parris et de Lange *comb. nov.*

Basionym: *Blechnum vulcanicum* var. *feani* E.D.Br., *Bull. Bernice P. Bishop Mus.* 89: 72, fig. 14A a, b (1931)

Type citation: ‘Marquesas, Hivaoa, Feani, altitude 700 meters, December, 1921, Brown no. 1086’

Type (*vide* Chambers & Wilson 2019): Marquesas: Hiva Oa, Feani, 800 m, Dec 1921, F.B.H. & E.D.W. Brown 1086 (lectotype: BISH 98739 (barcode BISH 1000233) *n.v.*; probable isolectotypes: Hivaoa, 800 m, Dec 1921, F.B.H. & E.D.W. Brown 1086 (BISH 496105–496106, *n.v.*).

= *Blechnum feani* (E.D.Br.) T.C.Chambers, *Telopea* 22: 50 (2019)

Cranfillia tovii (E.D.Br.) de Lange et Parris *comb. et stat. nov.*

Basionym: *Blechnum vulcanicum* var. *tovii* E.D.Br., *Bull. Bernice P. Bishop Mus.* 89: 72, 14B a, b (1931)

Type citation: ‘Marquesas, Nukuhiva, Tovii, altitude 1000 meters, July [sic], 1921, Brown no. 504 A. Type’

Type (*vide* Chambers & Wilson 2019): Marquesas, Nuku Hiva, Tovii 1000 m, 15 January 1921, F.B.H. Brown & Elizabeth D.W. Brown, 504A (holotype: BISH, barcode BISH 1021170 *n.v.*)

= *Blechnum tovii* (E.D.Br.) T.C.Chambers, *Telopea* 22: 50 (2019)

Cranfillia nukuhivensis (E.D.Br.) de Lange et Parris *comb. nov.*

Basionym: *Blechnum nukuhivense* E.D.Br., *Bull. Bernice P. Bishop Mus.* 89: 69, figs 13a–h (1931)

Type citation: ‘Marquesas, Nuku Hiva, Tovii, 1000 meters, July, 1921 Brown no. 529 A and B’.

Type (*fide* Chambers & Wilson 2019): Marquesas: Nuku Hiva: *E.D. Brown 529A* (lectotype: BISH 496201 *n.v.*)

Cranfillia megavulcanica (T.C.Chambers) Parris et de Lange *comb. nov.*

Basionym: *Blechnum megavulcanicum* T.C.Chambers, *Telopea* 22: 54 (2019)

Type: SOLOMON ISLANDS: Santa Ysabel: Summit ridge Mt Sasari near Maringe Lagoon 1097 m, 26 Oct 1963, *T.C. Whitmore BSIP 2393* (holotype: K 000754243 *n.v.*; isotype: L 3516913 *n.v.*)

Cranfillia phanerophlebia (Baker ex C.Chr.) de Lange et Parris *comb. nov.*

Basionym: *Blechnum phanerophlebium* Baker ex C.Chr., *Bull. Misc. Inform. Kew* 1939: 28 (1939)

Type (*fide* Chambers & Wilson 2019): Fiji: Viti Levu, sources of the Wai ni malu, 1877–1878, *Horne 939* (holotype: K 000721923 *n.v.*)

Cranfillia venosa (Copel.) Parris et de Lange *comb. nov.*

Basionym: *Blechnum venosum* Copel., *Occas. Pap. Bernice Pauahi Bishop Mus.* 14: 62, pl. 15 (1938)

Type (*fide* Chambers & Wilson 2019): TUBUAI (Austral Is.): Rapa: Taratika, east side Mount Perahu, moist bank in rainforest, 550 m, *St. John, Fosberg & Maireau 15651* (holotype: *n.v.*, specimen matching plate 15 not located; isotypes: MICH 1191204 (*ex herb.* Copeland), GH 00112368 *n.v.*, UC 542551 *nv.*, US 00135472 *n.v.*, K 000754215 *n.v.*, BISH 496204 *n.v.*, BISH 496205 *n.v.*)

Cranfillia humilis T.C.Chambers) de Lange et Parris *comb. nov.*

Basionym: *Blechnum humile* T.C.Chambers, *Telopea* 22: 56 (2019)

Type: INDONESIA: Papua Province: between camps 11 and 12, Mt. Carstensz [Puncak Jaya], 28 Jan 1913, *C. Boden Kloss s.n.* (holotype: BM 000801696 photo-seen)

Acknowledgements

We thank Matt Renner for useful discussion.

References

- Chambers TC, Wilson PG (2019) A revision of *Blechnum vulcanicum* (Blume) Kuhn and related taxa (Blechnaceae) in Malesia and Oceania. *Telopea* 22: 41–59.
- Council of Heads of Australasian Herbaria (2018) Australian Plant Consensus <https://biodiversity.org.au/nsl/services/rest/reference/apni/9787312> Accessed 20 August 2019.
- da Silva DM, da Silva Sylvestre L, Mendonca CBF, Gonçalves-Esteves V (2019) Spore diversity among species of Blechnaceae in the Atlantic Forest. *Acta Botanica Brasilica* 1–13. <https://doi.org/10.1590/0102-33062018abb0321>
- Dittrich VAO, Salino A, Monteiro R, Gasper AL (2017) The family Blechnaceae (Polypodiopsida) in Brazil: key to the genera and taxonomic treatment of *Austroblechnum*, *Cranfillia*, *Lomaridium*, *Neoblechnum* and *Telmatoblechnum* for southern and southeastern Brazil. *Phytotaxa* 303: 1–33. <https://doi.org/10.11646/phytotaxa.303.1.1>
- Farris E, Carta M, Circosta S, Falchi S, Papuga G, de Lange P (2018) The indigenous vascular flora of the forest domain of Anela (Sardinia, Italy). *Phytokeys* 113: 97–143 <https://doi.org/10.3897/phytokeys.113.28681>
- Gasper AL de, Almeida TE, Dittrich VAO, Smith AR, Salino A (2017) Molecular Phylogeny of the fern family Blechnaceae (Polypodiales) with a revised genus level treatment. *Cladistics* 33: 429–446. <https://doi.org/10.1111/cla.12173>

- Gasper AL de, Dittrich VAO, Smith AR, Salino A (2016) A classification for Blechnaceae (Polypodiales; Polypodiopsida); new genera, resurrected names and combinations, *Phytotaxa* 275: 191–227. <https://doi.org/10.11646/phytotaxa.275.3.1>
- Heenan PB, McGlone MS (2019) Cenozoic formation and colonisation history of the New Zealand vascular flora based on molecular clock dating of the plastid *rbcL* gene. *New Zealand Journal of Botany* [1–23]. <https://doi.org/10.1080/0028825X.2019.1632356>
- Jaman R (in press) Blechnaceae. Pp. 209–231 in Parris BS, Kiew R, Chung RCK, Saw LG (eds) *Flora of Peninsular Malaysia Series I: Ferns and Lycophytes. Vol 3* (Forest Research Institute Malaysia: Kepong)
- Molino S, Gabriel y Galan JM, Sessa E, Wasowicz P (2019) A multi-character analysis of *Struthiopteris* leads to the rescue of *Spicantopsis* (Blechnaceae, Polypodiopsida). *Taxon* 68:185–198. <https://doi.org/10.1002/tax.12036>
- New Zealand Plant Conservation Network (2003–) <http://www.nzpcn.org.nz/> Accessed 6 August 2019.
- Ngā Tipu o Aotearoa – New Zealand Plants (2002–) <https://nzflora.landcareresearch.co.nz/default.aspx?NavControl=home> Accessed 6 August 2019.
- Perrie LR, Wilson RK, Shepherd LD, Ohlsen DJ, Batty EL, Brownsey PJ, Bayly MJ (2014) Molecular phylogenetics and generic taxonomy of Blechnaceae ferns. *Taxon* 63: 745–758. <https://doi.org/10.12705/634.13>
- Pteridophyte Phylogeny Group [PPG] (2016) A community-derived classification for extant lycophytes and ferns. *Journal of Systematics and Evolution* 54: 563–603. <http://onlinelibrary.wiley.com/doi/10.1111/jse.12229/epdf>
- Smith AR, Kessler M (2018) Prodrromus of a fern flora for Bolivia. XXXIII. Blechnaceae. *Phytotaxa* 334(2): 99. <https://doi.org/10.11646/phytotaxa.334.2.1>
- Wilcox M, Warden J (2017) Botany of Hillsborough coast bush reserves, Manukau Harbour, Auckland. *Auckland Botanical Society Journal* 72: 32–46.

Manuscript received 13 August 2019, accepted 27 August 2019