

# Typification of names of South American taxa related to *Woodsia montevidensis* (Woodsiaceae)

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## Abstract

A revision of the nomenclature of six South American taxa related to *Woodsia* is presented, as a part of a taxonomic revision of the genus in South America. Lectotypes are selected for *Cheilanthes crenata*, *Woodsia crenata* var. *pallidipes*, *Woodsia incisa*, *Woodsia montevidensis* var. *fuscipes* and the second step lectotypification for *Dicksonia montevidensis* and *Woodsia peruviana*, based on the analysis of their protologues and original herbarium material. All names are currently synonyms of *Woodsia montevidensis*. *Physematium incisum* (Gillies ex Hook. & Grev.) Kunze constitutes an illegitimate name and *Physematium cumingianum* is considered as nomen inquirendum.

## Keywords

*Cheilanthes*, *Dialcalpe*, *Physematium*, nomenclature, *Woodsia*, Woodsiaceae

## Introduction

*Woodsia* (Polypodiidae: Woodsiaceae) is a genus comprising about 35–40 taxa of small and tufted ferns growing on or in the vicinity of cliffs and rocks (Brown 1964). They mainly occur in montane areas in the Northern Hemisphere, but few species are also present in South America and Southern Africa. The greatest species richness is found

in the Rocky Mountains of western North America (ca. 10 spp.) and the Himalayas in south Asia (ca. 19 spp.); absent from Australia, New Zealand, SE Asia, and the Pacific (Kramer 1990, Shao et al. 2015, Shmakov 2015). The Neotropical species belong to *Woodsia* subgenus *Physematium* (Kaulf.) Hook. emend. X.C. Zhang & R. Wei (Shao et al. 2015, Shmakov 2015). South American floristic works cite the genus *Woodsia* as being represented by a single, morphologically variable species, *Woodsia montevidensis* (Spreng.) Hieron., with a distribution ranging from Venezuela and Colombia to central Argentina and Southern Brazil (de la Sota 1977, Tryon and Stolze 1991).

In anticipation of the recent efforts to prepare floristic inventories for Neotropical and Andean regions of South America, especially the Flora of Argentina (<http://www.floraargentina.edu.ar>) and the Flora of Brazil (Mynssen 2016), the nomenclature of taxa related to the genus *Woodsia* from South America was re-examined, and we are here providing lectotypes for four names, and two second step lectotypifications with the aim of enhancing nomenclatural stability, following as closely as possible the authors' original intentions.

## Material and methods

We have analysed the protologues and morphological features from specimens of the following herbaria: B, BA, BAB, BM, CONC, CORD, CTES, HB, JUA, K, L, LE, LIL, LP, LZ, MCNS, MERL, MO, MVFA, NY, OXF, P, PR, PRC, R, RB, RCVC, RIOG, S, SI, US and W (acronyms see Thiers 2016). Typification was done according to the current edition of the International Code of Nomenclature for algae, fungi and plants (ICN) (McNeill et al. 2012) and considering the proposal concerning inadvertent lectotypifications and neotypifications (Prado et al. 2015).

## Typifications

In this paper we have arranged the South American taxa related to *Woodsia* in alphabetical order by the names under *Woodsia*, as all of them are current synonyms of *Woodsia montevidensis* (Spreng.) Hieron., following Brown (1964), de la Sota (1977), and Tryon and Stolze (1991).

1. *Woodsia crenata* (Kunze) Hieron. Bot. Jahrb. Syst. 34(4): 440. 1904.  $\equiv$  *Cheilanthes crenata* Kunze, Linnaea 9: 84. 1834. Type: Peru. "Peruv.(ia) Rupestribus ad Huanuco (6,200') Martio 1830 lectae" *E.F. Poeppig, s.n.* (Lectotype, designated here: W [W-0061329!]).

Since Kunze's own herbarium in Leipzig is destroyed, we looked for further original material of *Cheilanthes crenata* from Huanuco, Peru collected by Poeppig at B, BM, K, L, LE, MO, NY, OXF, P, PCR, US and W. We were able to find original material at W that agrees well with Kunze's original description, which we here select as lectotype, in order to avoid the misapplication of the name.

2. *Woodsia crenata* var. *pallidipes* Hieron., Bot. Jahrb. Syst. 34(4): 440. 1904. Type: Colombia. “Ad muros et rupes prope Puracé”, 2680-2800 m, 1 Feb 1884, *F.C. Lehmann* 3478. Lectotype (designated here): B [B-200170834!]; isolectotypes: B [B-200170833!], K [K-000632733!], US [US-00066996!].

When Hieronymus (1904) described *Woodsia crenata* var. *pallidipes*, he cited four collections, three from Colombia and two from Bolivia. Bolivia: “sine loco, 1863”, *Mandon* 19 B [B-200171567!, on the right side of the sheet] and *Mandon* 35 B [B-200171567!, on the left side of the sheet]. Colombia: “ad muros urbis Pasto”, 2500 m, 11 Feb 1881, *F.C. Lehmann* 656 B [B-20170836!], “ad muros et rupes prope Puracé”, 2680-2800 m., 1 Feb 1884, *F.C. Lehmann* 3478 B [B-20170834!, B-2017083!], K [K-000632733!], US [US-00066996!], “ad muros et rupes prope Yermal, in provincia Antioquia”, 1800-2400 m, Nov 1891, *F.C. Lehmann* 7411 B [B-20170835!], K [K-000632732!]. We selected a specimen from the *F.C. Lehmann* 3478 collection as lectotype because it corresponds with all characters used to describe the variety, furthermore the B specimen has a handwritten label by Hieronymus with the inscription “*Woodsia crenata* var. *pallidipes* Hieron.” and there are duplicates in three herbaria.

3. *Woodsia incisa* Gillies ex Hook. & Grev., Icon. Filic. 2. t. 191. 1831 ≡ *Physematium incisum* (Gillies ex Hook. & Grev.) C. Presl, Tent.: 66. 1836. Type: Argentina. Mendoza: near San Luis, *J. Gillies s.n.* Lectotype (designated here): BM [BM-000937851!]; isolectotypes BM [BM-000937850!]; K [K-000229420!].

The type material at BM consists of four fronds with two different barcodes on the same sheet: BM [BM-000937850 and BM-000937851], both with separate labels with the same information. We selected the material affiliated with BM [BM-000937851] as lectotype because it is more complete.

The specimen *J. Gillies* 8 housed at K [K-000229420!] is not part of the original material because it was collected at “Sierras de Tandil”, located in Buenos Aires province, Argentina, far away from the type locality.

The combination *Physematium incisum* (Gillies ex Hook. & Grev.) Kunze (Kunze 1837) is an illegitimate name, posterior to Presl’s combination.

4. *Woodsia montevidensis* (Spreng.) Hieron., Bot. Jahrb. Syst. 22: 363. 1896. ≡ *Dicksonia montevidensis* Spreng., Syst. Veg. 4(1): 122. 1827. Type: Uruguay. (“Brasilia”) [Montevideo], Pan d’Açucar, *F. Sellow d* 517. Lectotype (first step designated by Tryon & Stolze [1991: 94]), second step (designated here): B [B-200094654!]; isolectotype B [B-200120343!].

The protologue only expresses “Monte Video. *Sello*”. There are seven specimens of *Sellow* from Montevideo, five of them are kept in B, one in BM and another in K. Tryon and Stolze (1991: 94) typified *Woodsia montevidensis* with a specimen at B. From all specimens deposited in B, two of them are numbered *Sellow d* 517 B [B-200094654! and B-200120343!] from Montevideo, as well quoted by Hieronymus when he made the combination under *Woodsia* (Hieronymus 1896). The specimen B [B-200094654!] is selected here as lectotype because it corresponds with all characters

used to describe the species, and probably it was the specimen seen by Sprengel because it bears the annotation of G. Hieronymus “Original von Sprengel”. Also it shows on a second label n. 118. “(Sprengel)” on a third: “Pan d’Açucar”, and on the fourth: “d.517”. The specimen B [B-200120343!] is considered isolectotype.

The remaining specimens: B [B-200170837a], Montevideo, ex reliquiis Sellowianis, s.n., ded. Humboldt 1836, ex herb. Kunth, [the two fronds on the left], B [B-200170837b], Montevideo, Pan d’ Açucar, ex reliquiis Sellowianis, s.n., ded. Humboldt 1836 [the two fronds on the right], B [B-200120342 and B-200120344] bear the only annotation “Brasilia” without specific locality (same label Herb. Reg. Bero-linense, as K [K-000632729!], and BM [BM-000937849!], although probably being original material, are preferably excluded from lectotypification because the data of the label are not complete.

5. *Woodsia montevidensis* var. *fuscipes* Hieron., *Hedwigia* 46: 322. 1907. Type: Argentina. Salta. “Prov. de Salta, Los Potreros al pie del Nevado del Castillo, 24.03.1827”, *P.G. Lorentz & G.H.E.W. Hieronymus 138*. Lectotype (designated here): B [B-200171577!]; isolectotypes: B [B-200171580!, B-200171581!], CORD!.

When Hieronymus described the variety *fuscipes*, he mentioned five collections in the protologue. Two collections from Bolivia: Illimani between Pongo and Apatchate. alt.: 4350 m, 24 March 1873, collected by *A. Stübel 1239* (B [B-200171573!]) and La Paz, Murillo, Zongo (“prope Songo”), Nov 1890, collected by *M. Bang 878* (B [B-200171572!], MO [MO-1919967 digital image!]; P [P-01400358!]; PH [PH-00029464 digital image!]; UC not seen; US [US-00067000!]). From Argentina, three additional collections were considered by Hieronymus as belonging to this variety: *F. Schickendantz 68* (B [B-200171578!, B-200171579!]), *F. Schickendantz 360* (B [B-200171576!]), and *P.G. Lorentz & G.H.E.W. Hieronymus 138* (B [B-200171577!, B-200171580!, B-200171581!], CORD!). Specimens of all five collections are present at B. In order to avoid any ambiguity regarding the application of the name, the specimen *Lorentz & Hieronymus 138* (B [B-200171577!]) is selected as lectotype, while the three duplicates are regarded as isolectotypes in accordance to Art. 9.12 of the Code (McNeill et al. 2012). Also, the lectotype chosen shows the characters used to delimitate the variety and bears an annotation by Hieronymus “n. var.” and handwritten locality data.

6. *Woodsia peruviana* Hook., *Sp. Fil.* 1: 61, pl. 21B. 1844.  $\equiv$  *Diacalpe peruviana* (Hook.) Trevis., *Nuovo Giorn. Bot. Ital.* 7: 160. 1875. Type: Peru. “Huamantanga, shady places”, 1834–1835, *A. Mathews 602*. Lectotype (first step designated by Tryon & Stolze (1991: 94), second step (designated here): K [K-000632731!]; isolectotypes B [B-20 0094655!, B-20 0171563!], BM [BM-000937848 digital image!], GH [GH-00022287 digital image!], and K [K-000632730 digital image!].

Tryon and Stolze (1991: 94) typified *Woodsia peruviana* with a specimen at K as holotype, but K holds two sheets of *Mathews 602* [K-000632730 and K-000632731],

the last one is here designated as lectotype because the material is more complete, has a handwritten annotation “Peru, Mathews” and “*Woodsia peruviana* Hook. Spec. Fil. Tab. XXI” on the sheet, and the label contains the locality data.

The specimen *A. Mathews s.n.* (US [US-00067001!]), according with Taylor’s annotation in the label of the specimen, could probably be part of the type collection, but we prefer to exclude it of lectotypification because the locality is not clear (only “Peru” is written in the label) and it is not originally numbered by Mathews.

## Unresolved name

*Woodsia cumingiana* (Kunze) Hook., Sp. Fil. [W. J. Hooker] 1: 61. 1844.  $\equiv$  *Physemantium cumingianum* Kunze, Analecta Pteridogr.: 43. 1837. Type: “Habitat probabiliter in Chile, misit *H. Cuming*” (Herb. Kunze in LZ, destroyed).

The original material of this species, deposited in LZ, was destroyed. As Kunze (1837) observed in the protologue: “unicum vidi specimen observed”, there is not referable isotype or even an illustration of the species. According to Stafleu and Cowan (1979), the original material of *H. Cuming* is kept at BM; however, no syntypes were found in this herbarium, nor in the Herbarium Hookerianum (K). Additionally, no material of this species from Chile was in B, BR, BM, E, GH, L, LE, OXF, P, W and Z, where duplicates of *H. Cuming* are deposited. Also, as consigned by Hooker (1844), most probably the type locality is mistaken, because he had the opportunity to revise the collections of Cuming immediately after his return and he was not able not find any specimen gathered by Cuming from either Chile or Peru. As the protologue expresses, the species is characterized by last segments oblong rounded, glanduloso-dentate decurrent, sori solitary upon the teeth, involucre glabrous, rachis and stipe subglabrous purple. With such description, the species is hardly to differentiate from many species of *Woodsia*, hence, the name is considered here as nomen inquirendum.

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## References

- Brown DFM (1964) A monographic study of the fern genus *Woodsia*. Beihefte Nova Hedwigia 16: 1–154.
- de la Sota ER (1977) Pteridophyta. In: Cabrera AL (Ed.) Flora de la Provincia de Jujuy. Colección Científica del Instituto Nacional de Tecnología Agropecuaria, Buenos Aires, 13: 1–275.
- Hieronymus GHEW (1896) Beitrage zur Kenntnis der Pteridophyten Flora der Argentina und einiger agrenzender Teile von Uruguay, Paraguay und Bolivien. Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 22: 359–420. <http://www.biodiversitylibrary.org/page/206739#page/369/mode/1up>
- Hieronymus GHEW (1904) Plantae Lehmannianae in Guatemala, Columbia et Ecuador regionibusque finitimis collectae, additis quibusdam ab aliis collectoribus ex iisdem regionibus allatis determinatae et descriptae. Pteridophyta. Linnaea 34: 417–582. <http://www.biodiversitylibrary.org/item/697>
- Kramer KU (1990) *Woodsia*. In: Kramer KU, Green PS (Eds) The Families and Genera of vascular plants- Volume I- Pteridophytes and Gymnosperms. Springer-Verlag, Berlin, 140.
- Kunze G (1837) Analecta pteridographica: seu Descriptio et illustratio filicum aut novarum, aut minus cognitarum. Impensis Leopoldi Voss, Leipzig, 1–50.
- McNeill J, Barrie FR, Buck WR, Demoulin V, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Marhold K, Prado J, Prud'homme van Reine WF, Smith GF, Wiersema JH, Turland NJ (Eds) (2012) International Code of Nomenclature for algae, fungi and plants (Melbourne Code) adopted by the Eighteenth International Botanical Congress Melbourne, Australia, July 2011. Regnum Vegetabile 154. Koeltz Scientific Books. <http://www.iapt-taxon.org/nomen/main.php>
- Mynssen CM (2016) Woodsiaceae. In: Lista de Espécies da Flora do Brasil. Jardim Botânico do Rio de Janeiro. <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB92305> [accessed 18 Jan. 2016]
- Prado J, Sylvestre LS, Labiak PH, Windisch PG, Salino A, Barros ICL, Hirai RY, Almeida TE, Santiago ACP, Kieling-Rubio MA, Pereira AFN, Øllgaard B, Ramos CGV, Mickel JT, Dittrich VAO, Mynssen CM, Schwartsburd PB, Condack JP, Pereira JBS, Matos FB (2015) Diversity of ferns and lycophytes in Brazil. *Rodriguésia*, v. 66, n. 4. doi: 10.1590/2175-7860201566410
- Prado J, Hirai RY, Moran RC (2015) (046–048) Proposals concerning inadvertent lectotypifications (and neotypifications). *Taxon* 64(3): 651. doi: 10.12705/643.29
- Röpert D (Ed.) (2000+ [continuously updated]) Digital specimen images at the Herbarium Berolinense. <http://ww2.bgbm.org/herbarium/default.cfm> [accessed 2015–2016]
- Shao Y, Wei R, Zhang X, Xiang Q (2015) Molecular Phylogeny of the Cliff Ferns (Woodsiaceae: Polypodiales) with a Proposed Infrageneric Classification. *PLoS ONE* 10(9): e0136318. doi: 10.1371/journal.pone.0136318
- Shmakov AI (2015) The new system of family Woodsiaceae Новая система семейства Woodsiaceae. *Turczaninowia* 18(2): 11–16. doi: 10.14258/turczaninowia.18.2.2
- Thiers B (2016) [continuously updated]: Index herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's virtual herbarium. <http://sweetgum.nybg.org/science/ih/> [accessed 1 Jan 2016]
- Tryon RM, Stolze RG (1991) 17. Dryopteridaceae. Pteridophyta of Peru, part IV. *Fieldiana, Botany* 27: 1–176.