



***Megalastrum oppositum* and *Ctenitis canacae* (Dryopteridaceae): A new combination and a new synonym, respectively, for Mascarene fern flora**

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Abstract

We synonymized *Ctenitis canacae* with *C. opposita* (basionym: *Aspidium oppositum*) and proposed a new combination, *Megalastrum oppositum*. We also lectotypified *Aspidium oppositum*.

Introduction

Ctenitis (C. Christensen) C. Christensen (1938: 544), a fern genus first distinguished as a natural group by Christensen (1938), contains about 100–150 species distributed in the New and Old World wet tropics (Christensen 1913, 1920, Mickel & Smith 2004). The best character to distinguish *Ctenitis* from others is its ctenitis hairs: these hairs consist of a few cells with quite thin walls and the apical cell is not acicular. When living, the hairs are quite terete and colourless, but when dried the lateral cell walls collapse irregularly so that the hairs on herbarium specimens are contorted and the contents of the cells turn to a rusty color (Holttum & Edwards 1986, Mickel & Smith 2004). The genus *Megalastrum* Holttum (1987: 161) is closely related to *Ctenitis*, but with a unique character combination that the basal basiscopic lobe of the pinnules gradually becomes adnate and decurrent to the pinna rachis and this adnate lobe is nourished by a vein that arises from the pinna rachis, not from the costule (Moran & Prado 2010). The systematics and nomenclature of *Ctenitis* are still ambiguous and many species are removed out of *Ctenitis* and placed in other genera (Holttum 1983, 1986, Holttum & Edwards 1986, Smith & Moran 1987, Sundue *et al* 2010, Rouhan & Moran 2011, Zhang 2012). In preparation for a revision of *Ctenitis* in the Old World, we found *Ctenitis canacae* Holttum (1983: 128) and *C. opposita* (Kaulfuss ex Sprengel) Copeland (1947: 124) are conspecific and the latter should be transferred to *Megalastrum*.

Taxonomy

Megalastrum oppositum (Kaulfuss ex Sprengel) Li Bing Zhang & Yi F. Duan, *comb. nov.*

Basionym: *Aspidium oppositum* Kaulfuss ex Sprengel (1827: 108).

Type:—REPUBLIC OF MAURITIUS. Trou Kanaka, 1827, *F. W. Sieber 36* (lectotype K-000351135!, isolectotypes B-200059372!, B-200059373!, B-200059378!, B-200059379!, BR-0000013468439!, K-000351133!, K-000351134!, P-00477807!, P-00477808!, P-00477809!, P-00483109!, W-0003940!, W-0003941!, W-1889-0361729!, W-1889-0362201!, **here designated**).

Homotypic synonyms:—*Ctenitis mascarenarum* (Urban) Tardieu-Blot (1954: 90), *nom. illeg.*; *C. opposita* (Kaulfuss ex Sprengel) Copeland (1947: 124); *Dryopteris opposita* (Kaulfuss ex Sprengel) Kuntze (1891: 813); *D. mascarenarum* Urban (1903: 14), *nom. illeg.*; *Lastrea opposita* (Kaulfuss ex Sprengel) C. Presl (1836: 393); *Nephrodium oppositum* (Kaulfuss ex Sprengel) Hooker (1862: 136).

Heterotypic synonyms:—*Ctenitis canacae* Holttum (1983: 128); *Megalastrum canacae* (Holttum) Holttum (1987: 161).

Type:—Republic of Mauritius. “Canaca”, 1868, *Sir H. Barkly s.n.* (holotype K-000501476!).

Distribution: Mauritius, Réunion.

The generic assignment of this species has been controversial. It was published firstly as a member of *Aspidium* Swartz (1801: 29) by Sprengel (1827), transferred to *Lastrea* Bory (1824: 588) by Presl (1836), moved again to *Dryopteris* Adans (1763: 20) by Kuntze (1891), and finally to *Ctenitis* by Copeland (1947). Urban (1903) mistakenly considered *A. oppositum* to be a later homonym of *A. oppositum* (Vahl) Swartz (1829: 67) and proposed the replacement name *Dryopteris mascarenarum* Urban (1903: 14) which was later transferred to *Ctenitis* by Tardieu-Blot (1954). The replacement name is obviously superfluous.

The type of *Aspidium oppositum* was stated to have come from South Africa (“C.B.S.”) (Sprengel 1827, Copeland 1947). However, Morton (1967: 37) found that this species was based on *Sieber 36* from Mauritius. Morton’s (1967) discovery and statement implicitly designated *Sieber 36* as the type of *A. oppositum*. There are 16 sheets of *Sieber 36* deposited at B, BR, K, P and W. Roux (2009: 135) listed three sheets of *Sieber 36* as ‘holo(types)’. His designation is invalid. We here designated K-000351135 as the lectotype (image available at <http://plants.jstor.org/specimen/k000351135?s=t>). After examination of *Sieber 36*, we found that all of these sheets represent the same species and this species has basal basisopic vein on the distal pinnules arising from the costa and hairs present on the adaxial surfaces of the axes with cells apparently twisted relative to each other when dried, which is consistent with *Megalastrum* as defined by Sundue *et al* (2010) and Rouhan and Moran (2011) but different from *Ctenitis*. Therefore, we transfer this species to *Megalastrum*.

When publishing *Ctenitis canacae* Holttum (1983: 128), he apparently overlooked Morton’s (1967) typification of *Aspidium oppositum*, but he stated that “If Kaulfuss’s type should be found, and if it agrees with the type I have proposed, the name *Ctenitis opposita* is available and would have to be used”. We checked the type of *C. canacae* and found that it agrees with the type of *C. opposita*. Therefore, *C. canacae* is a heterotypic synonym of *C. opposita*.

Acknowledgements

We thank James L. Reveal for helpful comments and the directors and curators of the herbaria B, BR, K, MO, NY, P, SING, UC, and W for providing access to the material in their care and the Doctorate Fellowship Foundation of Nanjing Forestry University, the fellowship of ‘A Project Founded by the Priority Academic Program Development of Jiangsu High Education Institutions (PAPD)’ and the Postgraduate Innovation Project Foundation in Jiangsu, China (CXZZ12-0518) to Y.-F.D.

References

- Adanson, M. (1763) *Familles des Plantes*, vol. 2. Paris: Chez Vincent.
<http://dx.doi.org/10.5962/bhl.title.271>
- Bory de Saint-Vincent, M. (1824) Fourrères. *Dictionnaire classique d'histoire naturelle* 6: 583–589.
<http://dx.doi.org/10.5962/bhl.title.33901>
- Christensen, C. (1913) A monograph of the genus *Dryopteris*. Part I. The tropical American pinnatifid bipinnatifid species. *Kongelige Danske Videnskabernes Selskabs Skriffter Naturvidenskabeliger og Mathematisk Afdeling* 10: 55–282.
- Christensen, C. (1920) A monograph of the genus *Dryopteris*. Part II, the tropical American bipinnate decomposed species. *Kongelige Danske Videnskabernes Selskabs Skriffter Naturvidenskabeliger og Mathematisk Afdeling* 6: 1–132.
- Christensen, C. (1938) Filicinae. Pp. 522–550 in: Verdoorn, F. (ed.), *Manual of Pteridology*. The Hague: Nihoff.
http://dx.doi.org/10.1007/978-94-017-6111-6_20
- Copeland, E.B. (1947) *Genera Filicum*. Waltham, Mass.: Chronica Botanica Co.
- Holttum, R.E. (1983) The fern-genera *Tectaria*, *Heterogonium* and *Ctenitis* in the Mascarene Islands. *Kew Bulletin* 38: 107–130.
<http://dx.doi.org/10.2307/4107974>
- Holttum, R.E. (1986) Studies in the fern-genera allied to *Tectaria* Cav. V. *Triplophyllum*, a new genus of Africa and America. *Kew Bulletin* 41: 237–260.
<http://dx.doi.org/10.2307/4102928>
- Holttum, R.E. (1987) Studies in the fern-genera allied to *Tectaria* Cav. VI. A conspectus of genera in the Old World regarded as related to *Tectaria*, with descriptions of two genera. *The Gardens’ Bulletin Singapore* 39: 153–167.
- Holttum, R.E. & Edwards, P.J. (1986) Studies in the fern genera allied to *Tectaria* II. *Dryopsis*, a new genus. *Kew Bulletin* 41: 171–204.

<http://dx.doi.org/10.2307/4103042>

- Hooker, W.J. (1862) *Species Filicum*, vol. 4. London: W. Pamplin.
- Kuntze, C.E.O. (1891) *Revisio Generum Plantarum*, vol. 2. Leipzig: A. Felix.
- Mickel, J.T. & Smith, A.R. (2004) The pteridophytes of Mexico. *Memoirs of the New York Botanical Garden* 88: 1–1055.
- Moran, R.C. & Prado, J. (2010) *Megalastrum* (Dryopteridaceae) in Central America. *Kew Bulletin* 65: 137–188.
<http://dx.doi.org/10.1007/s12225-010-9214-3>
- Morton, C.V. (1967) Studies of fern types, I. *Contributions from the United States National Herbarium* 38: 29–83
- Presl, C.B. (1836) *Tentamen Pteridographiae, seu genera filicacearum praesertim juxta venarum decursum et distributionem exposita*. Pragae: Typis Filiorum Theophili Haase, 290 pp.
<http://dx.doi.org/10.5962/bhl.title.47011>
- Rouhan, G. & Moran, R.C. (2011). Monograph of the paleotropical species of *Megalastrum* (Dryopteridaceae). *Annals of the Missouri Botanical Garden* 98: 90–100.
<http://dx.doi.org/10.3417/2008129>
- Roux, J.P. (2009) *Synopsis of the Lycopodiophyta and Pteridophyta of Africa, Madagascar and neighbouring islands*. *Strelitzia* 23. Pretoria: South African National Biodiversity Institute, 296 pp.
- Smith, A.R. & Moran, R.C. (1987) New combinations in *Megalastrum* (Dryopteridaceae). *American Fern Journal* 77: 124–130.
<http://dx.doi.org/10.2307/1547480>
- Sprengel, C. (1827) *Systema Vegetabilium*. Editio decima sexta. Vol.4 (1). Gottingae: Sumtibus Librariae Dieterichianae, 592 pp.
<http://dx.doi.org/10.5962/bhl.title.822>
- Sundue, M., Rouhan, G. & Moran, R.C. (2010) *Megalastrum* (Dryopteridaceae) of the circumaustral region: Chile, Argentina, and southern islands of the Atlantic, Pacific, and Indian Oceans. *Systematic Botany* 35: 1–15.
<http://dx.doi.org/10.1600/036364410792495935>
- Swartz, O. (1801) Genera et species filicum. *Journal für die Botanik* (Schrader) 2: 29–43.
- Tardieu-Blot, M.L. (1954) Sur Quelques “Dryopteris” De La Reunion. *Notulae Systematicae* 15: 90–92.
- Urban, I. (1903) *Symbolae Antillanae seu Fundamenta Florae Indiae Occidentalis*, vol. 4. Lipsiae (Leipzig): Fratres Borntraeger, Paristis (Paris): Paul Klincksieck, and Londini (London): Williams & Norgate, 771 pp.
<http://dx.doi.org/10.5962/bhl.title.144>
- Zhang, L.-B. (2012) Reducing the fern genus *Dryopsis* to *Dryopteris* and the systematics and nomenclature of *Dryopteris* subgenus *Erythrovariae* section *Dryopsis* (Dryopteridaceae) *Phytotaxa* 71: 17–27.