

## New bryophyte records from New Caledonia

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**Abstract** – Two species of liverworts (*Anastrophyllum bidens*, *A. squarrosum*) and 10 species of mosses (*Acroporium rigens*, *Daltonia contorta*, *Dicranella setifera*, *Meiothecium hamatum*, *Papillidiopsis macrosticta*, *Pseudotaxiphyllum pohliaecarpum*, *Sematophyllum subpinnatum*, *Trichosteleum boschii*, *Trichosteleum stigmatum*, *Warburgiella philippinensis*) are reported as new to New Caledonia. *Daltonia*, *Dicranella*, *Papillidiopsis*, and *Pseudotaxiphyllum* are new genus reports for New Caledonia.

**Bryophytes / Flora / Distribution / New Caledonia**

### INTRODUCTION

New Caledonia is one of the biodiversity hotspots with a most distinct bryophyte flora. New checklists of the mosses, liverworts and hornworts of New Caledonia were published by Thouvenot & Bardat (2010) and Thouvenot *et al.* (2011). The moss list accepts 520 and the liverworts and hornworts list 482 specific or infraspecific taxa. Endemic bryophytes were estimated to be up to 39% (Thouvenot & Bardat, 2010; Thouvenot *et al.*, 2011). In comparison with other regions of Oceania, the moss flora of New Caledonia can be regarded as better known, though additions continue to be made (e.g. Müller, 2011, 2012; Engel *et al.*, 2012; Zhu & Müller, 2012; Thouvenot & Bardat, 2013).

The first author made collections of bryophytes during two expeditions to New Caledonia, in 2001 and 2003. Among these collections, species new to New Caledonia were found. Voucher specimens are deposited in the herbarium of the Institute of Botany of the University of Dresden (DR).

The present study contains a number of species of the family Sematophyllaceae. A high number of species of this family have been described from New Caledonia, but many of them are in need of a modern taxonomic revision. The checklist of Thouvenot & Bardat (2010) gives 45 species, of which 24 are allegedly endemic. In future studies many may be found to belong to the more widely distributed SE Asian or Oceanic species. What is remarkable in the present report is the increase of tropical Asiatic moss elements in the New Caledonian moss flora.

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## NEW SPECIES RECORDS LIST

### *Acroporium rigens* (Broth. ex Dixon) Dixon

New Caledonia, Parc Provincial de la Rivière Bleue, along the path from Refuge de la Rivière Bleue to Haute Pourina, epiphytic in rainforest, c. 300-800 m, 22°04'S, 166°37'E, 06 September 2001, *F. Müller NC267* (conf. B. Tan).

This species, new to Oceania, is known from West Malesia (Peninsular Malaysia and Borneo), Papua New Guinea (Tan *et al.*, 2007), and Vietnam (He & Khang, 2012).

### *Anastrophyllum bidens* (Reinw., Blume *et* Nees) Steph.

New Caledonia, Mont Humboldt, southern slope below the mountain hut, on the forest floor, on rotten wood and epiphytic in mossy rainforest, c. 700-1400 m, 21°54'S, 166°24'E, 30 August 2003, *F. Müller NC696*, *F. Müller NC698*, *F. Müller NC697* (conf. J. Váña), *F. Müller NC695*, *F. Müller NC701* (det. J. Váña). New Caledonia, Mont Humboldt, southern slope between the mountain hut and the top, epiphytic and on rotten wood in montane rainforest, c. 1400-1600 m, 21°53'S, 166°25'E, 31 August 2003, *F. Müller NC699* (conf. J. Váña), *F. Müller NC700*. New Caledonia, Mt. Ouin, epiphytic in mossy rainforest, c. 1000 m, 22°01'S, 166°28'E, 01 September 2003, *F. Müller NC694*, *F. Müller NC690* (det. J. Váña).

*Anastrophyllum bidens* is known from Australia (Queensland), Bhutan, China, Indonesia, Japan, Malaysia, Nepal, Papua New Guinea, Philippines, Sri Lanka, and Thailand (Váña & Piippo, 1989).

There are two known varieties, var. *bidens* and var. *aristatum* Herzog *ex* N.Kitag. Daniels *et al.* (2012) raised the latter variety to species rank as *A. aristatum* (Herzog *ex* N.Kitag.) A.E.D.Daniels, D.G.Long, K.C.Kariyappa *et* P.Danie. The specimens from New Caledonia belong to var. *bidens* (= *A. bidens* s. str.).

### *Anastrophyllum squarrosum* Herzog

New Caledonia, Mt. Ouin, epiphytic in mossy rainforest, c. 900-1100 m, 22°01'S, 166°28'E, 01 September 2003, *F. Müller NC693* (conf. J. Váña).

This is the first record for Oceania. The known distribution area of the species includes Indonesia (Java, Sulawesi), Malaysia (northern Borneo), Papua New Guinea, and Philippines (Váña & Piippo, 1989; Milliken & Proctor, 1999).

### *Daltonia contorta* Müll.Hal.

New Caledonia, Mt. Ouin, mossy rainforest, on small twigs together with *Metzgeria furcata* (L.) Corda, c. 900-1100 m, 22°01'S, 166°28'E, 01 September 2003, *F. Müller NC711*.

This is a new genus record for New Caledonia. The hitherto known range of the species includes Australia (Queensland), Borneo, China (Taiwan), Fiji, Hawaii, Java, Malaya, Papua New Guinea, Philippines, Sri Lanka, Sulawesi (Mohamed & Robinson, 1991; Streimann, 2000).

***Dicranella setifera* (Mitt.) A.Jaeger**

New Caledonia, Cascade de Tao NW Hienghène, on wet rocks along the stream, c. 20-100 m, 20°33'S, 164°47'E, 08 September 2003, *F. Müller NC710*.

This is a new genus record for New Caledonia. *Dicranella setifera* is known from Bangladesh, Bhutan, China, India, Indonesia, Malaysia, Papua New Guinea, and Philippines (Norris & Koponen, 1990; Banu-Fattah & Hadiuzzaman, 1996; Suleiman *et al.*, 2006; He, 2013).

***Meiothecium hamatum* (Müll.Hal.) Broth.**

New Caledonia, Mont Humboldt, southern slope below the mountain hut, epiphytic in mossy rainforest, c. 1300 m, 21°54'S, 166°24'E, 30 August 2003, *F. Müller NC539* (conf. B. Tan).

This species is widely distributed in tropical SE Asia (Andaman, China, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand) and Oceania (Fiji, Samoa) (Tan *et al.*, 2011; Schultze-Motel, 1974).

***Papillidiopsis macrosticta* (Broth. et Paris) W.R.Buck et B.C.Tan**

New Caledonia, Mont Panié, along the hiking trail from the street RPN3 to the summit, epiphytic in rainforest, c. 1000 m, 20°35'S, 164°47'E, 13 September 2001, *F. Müller NC135* (conf. B. Tan).

This is a new genus report for New Caledonia. The hitherto known distribution includes China, Japan, Kampuchea, Laos, Thailand, and Vietnam (Jia *et al.*, 2005). The species is also reported here as new to Oceania.

***Pseudotaxiphyllum pohliaecarpum* (Sull. et Lesq.) Z.Iwats.**

New Caledonia, Noumea NNE, along the path from Auberge de Koghi to Mont Bou, montane rainforest, earthy slopes, c. 850 m, 22°10'S, 166°31'E, 09 September 2001, *F. Müller NC76* (det. B. Tan). New Caledonia, Mont Panié, along the hiking trail from the street RPN3 to the summit, on the forest floor in rainforest, c. 500 m, 20°34'S, 164°48'E, 13 September 2001, *F. Müller NC57*; dto. on wet rocks along a brook, c. 1300 m, *F. Müller NC145*. New Caledonia, Col de Amieu near Sarraméa, rainforest, earthy slopes in a valley, c. 470-550 m, 21°36'S, 165°49'E, 09 September 2003, *F. Müller NC737*. New Caledonia, Sarraméa, along the path from Sarraméa to the Plateau de Dogny, earthy slopes along a path, c. 450 m, 21°37'S, 165°52'E, 05 September 2003, *F. Müller NC736*.

This is a new genus report for New Caledonia. It's surprising that this conspicuous species was hitherto not reported from New Caledonia. The plants are rather robust; the leaves are complanate and often have a reddish or purple shine. The frequent presence of clustered brood bodies in the leaf axils is an additional diagnostic characteristic.

*Pseudotaxiphyllum pohliaecarpum* is widely distributed in tropical and subtropical S and SE Asia (China, India, Indonesia, Japan, Laos, Malaysia (Pahang, Sabah, Sarawak), Nepal, Philippines, South Korea, Sri Lanka, Thailand, Vietnam) (Tan & Iwatsuki, 1991; Higuchi & Long, 2002; Zhang & He, 2005; Suleiman *et al.*, 2006; Ariyanti *et al.*, 2009; Ramsay, 2012). Northernmost and southernmost outliers are the Kuril Islands in Russia (Bakalin *et al.*, 2009) and Australia (New South Wales) (Ramsay, 2012).

***Sematophyllum subpinnatum*** (Brid.) E. Britton

New Caledonia, Cascade de Tao NW Hienghène, on wet rocks along the stream, c. 20-100 m, 20°33'S, 164°47'E, 08 September 2003, *F. Müller NC549* (conf. B. Tan).

This species has a pantropical distribution. The nearest records are from Australia (Northern Territory, Queensland, New South Wales, Victoria) (Ramsay *et al.*, 2002).

***Trichosteleum boschii*** (Dozy *et* Molk.) A. Jaeger

New Caledonia, Mont Panié, along the hiking trail from the street RPN3 to the summit, rainforest, on the forest floor, c. 400 m, 20°34'S, 164°48'E, 13 September 2001, *F. Müller NC204* (det. B. Tan).

*Trichosteleum boschii* is widely distributed through SE Asia (Bangladesh, China, India, Indonesia, Japan, Kampuchea, Korea, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, Vietnam) extending to Oceania (Fiji, Hawaii, Solomon) and Australia (Queensland) (Ramsay *et al.*, 2004; Tan *et al.*, 2007; Pollawatn, 2008).

***Trichosteleum stigosum*** Mitt.

New Caledonia, Port Boise, path along the coast from Gite Kaa Nua to Rivière du Trou Bleu, lowland rainforest, on rotten wood, 10 m, 22°21'S, 166°58'E, 8 September 2001, *F. Müller NC81* (det. B. Tan).

This is a species widely distributed in SE Asia (China, India [Kerala], Indonesia, Malaysia, Papua New Guinea, Philippines, Singapore, Thailand) extending eastwards to Oceania (Fiji, Samoa) (Suleiman *et al.*, 2006; Tan *et al.*, 2007; Manju *et al.*, 2012; Printarakul *et al.*, 2012).

***Warburgiella philippinensis*** (R.S. Williams) Broth.

New Caledonia, Mont Mou bei Païta, epiphytic in montane rainforest, c. 1200 m, 22°04'S, 166°20'E, 10 September 2001, *F. Müller NC389* (det. B. Tan).

*Warburgiella philippinensis* was hitherto only known from the Philippines (Tan & Iwatsuki, 1991).

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