

New and remarkable moss records from New Caledonia

Frank MÜLLER*

*Technische Universität Dresden, Institut für Botanik,
Mommсенstr. 13, D-01062 Dresden, Germany*

(Received 20 August 2011, accepted 2 December 2011)

Abstract – Five species of mosses (*Anomodon pseudotristis*, *Calymperes afzelii*, *C. motleyi*, *Mesonodon flavescens*, *Mitthyridium flavum*) are reported as new for New Caledonia. *Anomodon* and *Mesonodon* are new genus reports for New Caledonia. *Calomnium iwatsukii*, a species endemic to New Caledonia and hitherto only known from the type locality, is recorded from a second locality. Sporophytes of *Sphagnum novo-caledoniae* were found for the first time and are described. The following sporophytic features of *S. novo-caledoniae* are rare or absent among the genus *Sphagnum*: sporophytes developed on elongated branches, capsules immersed in perichaetial leaves, pseudopodium extremely short, pseudostomata absent from capsule surface.

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

INTRODUCTION

The first modern checklist of the mosses of New Caledonia was published by Pursell & Reese (1982) and an updated list of the mosses of New Caledonia was published by Thouvenot & Bardat (2010). This list includes 520 specific and infraspecific moss taxa. In comparison with other regions of Oceania the moss flora of New Caledonia can be regarded as well known, although there is little doubt that additions will continue to be made (e.g. Müller, 2011).

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

* Correspondence and reprints: Frank.Mueller@tu-dresden.de

SPECIES LIST

***Anomodon pseudotristis* (Müll.Hal.) Kindb.**

New Caledonia, Sarraméa, along the path from Sarraméa to Plateau de Dogny, epiphytic in rainforest, ca 100 m, 21°38'S, 165°52'E, 5 Sept. 2003, *F. Müller NC520*.

This is a new genus report for New Caledonia. The nearest previously known records of the species are in Queensland and New Zealand (Granzow de la Cerda, 1997). Otherwise the species is known from east and southern Africa including the East African islands, tropical and subtropical Asia (China, Japan, Korea, Sri Lanka, Thailand, Vietnam), and Hawaii (Granzow de la Cerda, 1997).

***Calomnion iwatsukii* Vitt**

New Caledonia, Mont Mou bei Païta, epiphytic on tree fern stems in montane rainforest, c. 1200 m, 22°04'S, 166°20'E, 10 Sept. 2001, *F. Müller NC346*.

The species was described by Vitt (1995) and was hitherto only known from the type locality in the northwestern part of New Caledonia (Mont Mandjélia west of Pouébo, ridge and valley below summit at 600-700 m elev., on tree fern trunk). The new record is only the second for the species. The locality is in the southeastern part of New Caledonia in a distance of 270 km from the type locality.

The species is dioicous. Like the type material, the collection from the new site does not include sporophytes; perigonia are present but not perichaetia. Vegetative leaves have excurrent costa; lateral leaves are lanceolate to oblong-oblancheolate; ventral leaves ovate to elliptic-oblong; the leaf margin is crenulate, and upper leaf cells slightly bulging, 5-8 µm, rounded, isodiametric.

The information from Vitt (1995) on the presence of *C. iwatsukii* on New Caledonia was overlooked by Thouvenot & Bardat (2010) and the genus and species not included in their checklist.

***Calymperes afzelii* Sw.**

New Caledonia, Sarraméa, along the path from Sarraméa to the Plateau de Dogny, epiphytic in rainforest, ca 100 m, 21°38'S, 165°52'E, 5 Sept. 2003, *F. Müller NC563*.

New for New Caledonia. A pantropical species, widely distributed in SE Asia and Oceania (Reese *et al.*, 1986), but hitherto unknown from New Caledonia.

***Calymperes motleyi* Mitt.**

New Caledonia, Koumac 15 km NNE, limestone rocks along the street RPN7, on sunny limestone rocks, ca 200 m, 20°27'S, 164°22'E, 8 Sept. 2003, *F. Müller NC564*.

New for New Caledonia. Widespread in tropical areas of the Indian and Pacific Ocean (Aldabra, Australia (Queensland), Borneo, Celebes, Coral Islands, Ellice Island, Fiji, Gilberts, Java, Laccadives, Malaya, Marshall Islands, Seychelles, Singapore, Society Islands, Socotra, Thailand, and Torres Straits). The nearest known records are from Fiji (Reese *et al.*, 1986).

***Mesonodon flavescens* (Hook.) W.R.Buck**

New Caledonia, Mont Mou near Païta, southwestern slope near the sanatorium, epiphytic in rainforest, ca 450 m, 22°05'S, 166°20'E, 10 Sept. 2001, *F. Müller NC343*.

A new genus record for New Caledonia. The species has a pantropical distribution. The nearest records are from Australia (Queensland) and Fiji (Miller *et al.*, 1978).

***Mitthyridium flavum* (Müll. Hal.) Rob.**

New Caledonia, Col de Amieu near Sarraméa, rainforest, epiphytic on palm tree, ca 470-550 m, 21°36'S, 165°49'E, 9 Sept. 2003, *F. Müller NC565*.

New for New Caledonia. Widely distributed in tropical SE Asia and also known from Australia (Queensland) (Reese *et al.*, 1986).

***Sphagnum novo-caledoniae* Paris et Warnst.**

New Caledonia, Mont Panié, along the hiking trail from the street RPN3 to the summit, montane rainforest, on rocks in a small brook, ca 1100 m, 20°35'S, 164°48'E, 13 Sept. 2001, *F. Müller NC148*.

The species is endemic to New Caledonia and seems to have a very restricted distribution on the island, being treated as Vulnerable in the IUCN Red List of Threatened Species (IUCN 2011).

A detailed description of the species was provided by Iwatsuki (1986). The species has some morphological features that are rare or absent from most species of *Sphagnum*. Iwatsuki (1986) found fasciculate brown rhizoids on the tips of branches of *S. novo-caledoniae*. In the Sphagnopsida, the development of rhizoids is otherwise only known in *Ambuchanania leucobryoides* (T.Yamag., Seppelt et Z.Iwats.) A.J.Shaw. Other special characteristics include the lack of fibrils in the branch and stem leaves, branches mostly single at a node, and pores of the leucocysts unringed and with a net-like arrangement.

Hitherto, sporophytes were unknown. The present specimen bears sporophytes, and the species description of Iwatsuki (1986) can be supplemented from a study of this sporophytic material as follows (Fig. 1).

Sporophytes terminal on elongated, very laxly foliated branches. Perichaetial leaves enlarged, bigger than branch and stem leaves, 1.8-2.0 mm long × 0.7-0.85 mm wide, lingulate, concave, apex rounded-truncate, entire to erose-dentate, border of elongated cells distinct, to three cells wide, cells thick-walled, leucocysts only in the upper 1/3 with pores, in the lower 2/3 without pores, leucocysts in lower 2/3 60-125 µm long × 17-25 µm wide, in upper 1/3 shorter and broader, 60-80 µm long × 30-48 µm wide.

Capsule immersed in perichaetial leaves, pseudopodium extremely short. Capsule obloid, 0.8-1.1 mm long × 0.5-0.7 mm wide, barely twice as long as wide, brown when mature. Cells of the exothecium in the area of the capsule mouth 14-21 µm wide × 12-26 µm high, walls thin, brown, corners with brownish thickenings. Urn cells 16-19 µm wide × 24-41 µm high, walls thin, sinuose, corners without thickenings; pseudostomata absent from capsule surface. Spores with a conspicuous triradiate scar on inner face, 40-43 µm, hyaline, smooth.

Together with the special gametophytic features listed by Iwatsuki (1986), the following sporophytic features of *S. novo-caledoniae* are apparently rare or absent in the genus *Sphagnum*: sporophytes developed on elongated branches, capsules immersed in perichaetial leaves, pseudopodium extremely short, pseudostomata absent from capsule surface.

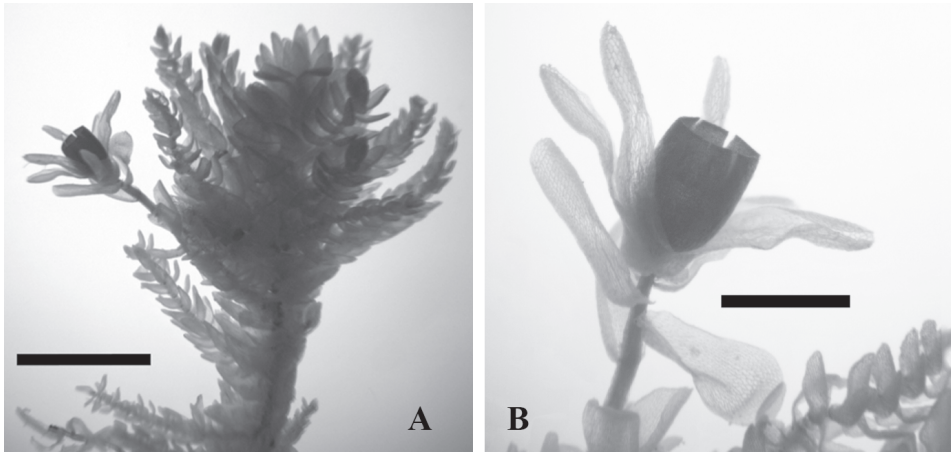


Fig. 1. *Sphagnum novo-caledoniae*. **A.** Stem with sporophyte inserted terminal on elongated, very laxly foliated branch. Scale 3 mm. **B.** Detail of a branch with sporophyte. Scale 1 mm. From F. Müller NC148.

Similar sporophytes are known from *S. cyclophyllum* Sull. & Lesq., *S. microcarpum* Warnst., *S. macrophyllum* Brid. and *S. pylaesii* Brid., a group of species investigated with molecular methods by Shaw *et al.* (2004). The systematic placement of these species has been a source of controversy. The phylogenetic analyses of Shaw *et al.* (2004) resolve them in a well-supported monophyletic group within the section *Subsecunda*. A molecular investigation of *S. novo-caledoniae* is recommended to determine its systematic position.

Acknowledgements. I am grateful to M.J. Wigginton (Peterborough) for comments on the manuscript and for checking the English.

REFERENCES

- GRANZOW DE LA CERDA I., 1997 — Revision and phylogeny of *Anomodon* and *Herpetineuron* (Anomodontaceae, Musci). *Contributions from the university of Michigan herbarium* 21: 205-275.
- IUCN, 2011 — *IUCN red list of threatened species*. Version 2011.1. www.iucnredlist.org. Downloaded on 04 August 2011.
- IWATSUKI Z., 1986 — A peculiar New Caledonian *Sphagnum* with rhizoids. *The bryologist* 89: 20-22.
- MILLER H. A., WHITTIER H. O. & WHITTIER B. A., 1978 — Prodrum florae muscorum Polynesiae. *Bryophytorum bibliotheca* 16: 1-334.
- MÜLLER F., 2011 — *Euptychium piliferum* sp. nov. (Ptychomniaceae) from New Caledonia. *Cryptogamie, Bryologie* 32: 391-396.
- PURSELL R. A. & REESE W. D., 1982 — The mosses reported from New Caledonia. *Journal of the Hattori botanical laboratory* 53: 449-482.
- REESE W. D., KOPONEN T. & NÖRRIS D. H., 1986 — Bryophyte flora of the Huon Peninsula, Papua New Guinea. XIX. *Calymperes*, *Syrhropodon* and *Mitthyridium* (Calymperaceae, Musci). *Acta botanica Fennica* 133: 151-202.
- SHAW J., COX C. J. & BOLES S. B., 2004 — Phylogenetic relationships among *Sphagnum* sections: *Hemitheca*, *Isocladus*, and *Subsecunda*. *The bryologist* 107: 189-196.
- THOUVENOT L. & BARDAT L., 2010 — Liste actualisée et annotée des mousses de Nouvelle-Calédonie. *Cryptogamie, Bryologie* 31: 163-197.
- VITT D. H., 1995 — The Genus *Calomnion* (Bryopsida): Taxonomy, Phylogeny, and Biogeography. *The bryologist* 98: 338-358.