New synonymy in *Macromitrium* (Musci, Orthotrichaceae) and *Syrrhopodon* (Musci, Calymperaceae) in the bryoflora of Réunion Island

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(Received 2 May 2007, Accepted 21 June 2007)

**Abstract** – New synonyms are proposed in the moss families Orthotrichaceae and Calymperaceae occurring in Réunion Island. *Macromitrium rufescens* Besch. (Orthotrichaceae) is placed in synonymy with *Macromitrium sulcatum* (Hook.) Brid. subsp. *sulcatum* and *Syrrhopodon rodriguezii* Renaud & Cardot (Calymperaceae) is found to be conspecific with *Syrrhopodon mahensis* Besch. var. *mahensis*.

**Orthotrichaceae / Macromitrium / Calymperaceae / Syrrhopodon / New synonymy / Réunion Island**

**Résumé** – On propose de nouveaux synonymes dans les familles de mousse Orthotrichaceae et Calymperaceae se produisant dans la Réunion. *Macromitrium rufescens* Besch. (Orthotrichaceae) est placé dans la synonymie avec *Macromitrium sulcatum* (Hook.) Brid. var. *sulcatum* et *Syrrhopodon rodriguezii* Renaud & Cardot (Calymperaceae) s’avère conspécifique avec *Syrrhopodon mahensis* Besch. var. *mahensis*.

**Orthotrichaceae / Macromitrium / Calymperaceae / Syrrhopodon / Nouveaux synonymes / La Réunion**

**INTRODUCTION**

Ah-Peng & Bardat (2005), in their recent checklist of the bryophytes of Réunion Island, list ten species in the genus *Macromitrium* (Orthotrichaceae) and ten species in the genus *Syrrhopodon* (Calymperaceae). Presented below are a summary of subsequent taxonomic and nomenclatural changes and proposals for some new synonymy affecting these genera in Réunion Island (see Appendix).

Under the family Orthotrichaceae, Ah-Peng & Bardat (2005) list *Macromitrium scleropodium* Besch. and *Macromitrium gimalacii* Bizot & Onr. The former has since been placed in synonymy with *Macromitrium orthostichum* Nees ex Schwägr. (Wilbraham, 2007), and the latter in synonymy with *Macrocoma*

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lycopodioides (Schwägr.) Vitt (Arts, 2005). Both Macromitrium orthostichum and Macrocoma lycopodioides were previously unrecognised for Réunion Island. In this paper, Macromitrium rufescens Besch., known from East Africa and the East African Islands (including Réunion Island), is recognised as conspecific with the more widely distributed Macromitrium sulcatum (Hook.) Brid. subsp. sulcatum.

In the family Calypemenaceae, Ah-Peng & Bardat (2005) list three varieties of Syrrhopodon prolifer Schwägr. in addition to the type variety: S. prolifer var. acanthoneuros (Müll.Hal.) Orbán & W.D.Reese, S. prolifer var. hispidocostatus (Renauld & Cardot) Orbán & W.D.Reese and S. prolifer var. seychellarum Orbán. Subsequent research (Ellis, 2005) suggests that var. acanthoneuros is a neotropical variety, with its supposed representatives in Réunion Island referable to Syrrhopodon apertifolius Besch., that var. hispidocostatus should be regarded as a species – Syrrhopodon hispidocostatus Renauld & Cardot (very rare in Réunion Island), and that var. seychellarum is a synonym of Syrrhopodon albidus Thwaites & Mitt. subsp. integrifolius (E.B.Bartram) L.T.Ellis. Further to these proposed alterations to Syrrhopodon in the checklist for Réunion Island, Ah-Peng et al. (2005) have added Syrrhopodon pottioides Orbán, and Arts (2005) has newly recorded Syrrhopodon crenulatus (Tixier) W.D.Reese and Syrrhopodon africanaus (Mitt.) Paris var. africanaus. In this paper, Syrrhopodon rodriquezii Renauld & Cardot, regarded as endemic to Réunion Island, and the earlier published Syrrhopodon mahensis Besch., are shown to be conspecific.

SYSTEMATICS

MACROMITRIUM (Orthotrichaceae)

Macromitrium sulcatum (Hook.) Brid. subsp. sulcatum, Bryol. Univ. 1: 319. 1826. 
Figs 1-5


Discussion – Macromitrium sulcatum (Hook.) Brid. is a widespread and polymorphous species that was originally described by Hooker (1819) from Nepal. It is distinguished by a robust habit; branch leaves contorted and twisted when dry;
a tuberculate leaf base with an area of thin-walled hyaline cells adjacent to the base of the costa (Fig. 5); upper laminal cells smooth and somewhat bulging and the peristome consisting of a low double membrane (Eddy, 1996; Magill & van Rooy, 1998). This species has an African-Indo-Malesian distribution, widespread across sub-Saharan Africa (O'Shea, 2006), and extending eastwards through India, Sri Lanka, East Nepal, Myanmar, Thailand (Gangulee, 1976), Vietnam, Malay Peninsula, Borneo (Nair et al., 2005) and the Philippines (Luzon, Mindanao) (Bartram, 1939).
Although no modern treatment has provided a satisfactory review of this variable species across its entire range, on the Indian subcontinent and Sri Lanka, local variations in form have been recognised as three subspecies and one variety: *Macromitrium sulcatum* subsp. *ceylanicum* (Mitt.) M.Fleisch.; *Macromitrium sulcatum* subsp. *neelgheriense* (Müll.Hal.) M.Fleisch.; *Macromitrium sulcatum* subsp. *ramentosum* (Thwaites & Mitt.) M.Fleisch. and *Macromitrium sulcatum* var. *toralosum* (Mitt.) Tixier (O’Shea, 2002). Initial investigation of these infraspecific taxa suggests that they may have been created unnecessarily. However, further research is required and will be the subject of a future paper.

In the course of identifying recent collections of *Macromitrium* from Réunion Island, the type specimen of *Macromitrium rufescens* Besch. (Réunion, Richard s.n., BM) was examined and found to have features largely matching those of *Macromitrium sulcatum* subsp. *sulcatum*. However, some features of this type material differ slightly from those in the type of *Macromitrium sulcatum* (Nepal, Gardner s.n., BM). Shoots in the latter possess broadly lanceolate branch leaves with a somewhat mucronate costa, the perichaetial leaves are short ovate to ovate-lanceolate and have sporophytes with setae up to 6 mm long. Type material of *Macromitrium rufescens* (BM) typically has shoots with narrower branch leaves and possesses a costa ending just below the leaf apex, the perichaetial leaves are ovate-lanceolate to oblong-lanceolate and setae reach some 20 mm long. Specimens examined from across the geographical range of *M. sulcatum* show intermediate forms of these differing features (e.g. Uganda, O’Shea U5447a; India, Wallich s.n.; Philippines, Merrill 7824 – In the latter collection, both extremes of variation in the perichaetial leaves are represented in a single perichaetium). Therefore, these minor differences, when considered within the context of this highly variable species, do not provide sufficient justification for retaining *M. rufescens* as a distinct species or for giving it an infraspecific rank within *M. sulcatum*. *Macromitrium rufescens* Besch. has been recorded from Kenya, Tanzania, Comoros, Réunion Island and Madagascar (O’Shea, 2006). Its recognition as a synonym of *Macromitrium sulcatum* subsp. *sulcatum* adds Réunion Island to the geographical range of the latter.

**Selection of specimens examined**

*Macromitrium sulcatum (Hook.) Brid. subsp. sulcatum.* SÃO THOMÉ: 1885, Moller s.n. (BM000868401, type of *Macromitrium undatifolium* Müll.Hal.).

CAMEROON: Mann, s.n. (BM000868395, isotype of *Macromitrium levatum* Mitt.).


RÉUNION ISLAND: Boivin s.n. (BM000872023, syntype of *M. rufescens*).

Borgen s.n. (BM). Bory s.n. (BM000872021, syntype of *M. rufescens*). G. de L’Isle 254 (BM000868302, paratype of *M. rufescens*). 1839, Lepervanche s.n. (BM000870034, syntype of *M. rufescens*). Hell Boung - GRR1 menant à la forêt de Béolouve, 1205 m, 26 June 2005, Bardat R476/1 (BM). INDIA: Assam, Wallich s.n. (BM000878039). Nilgiri, Gardener 35, (BM000878040). Khasia, J.D.Hooker 223 (BM000878042). Mahabaleshwar, 6 March 1962,
SYRRHOPODON (Calympereaceae)


**Discussion** – *Syrrhopodon rodriquezii* Renauld & Cardot has been regarded as a good species endemic to Réunion Island1. However, its essential features are identical to those of *Syrrhopodon mahensis* Besch. described from the Seychelles (Bescherelle, 1880). Orbán & Reese (1986), in their key to African species of *Syrrhopodon*, maintain both of these taxa and distinguish them by features of the leaf margin. In *S. mahensis*, the differentiated rib forming the leaf margin is said to incorporate a strand of stereids (Fig. 10), while that in *S. rodriquezii* is said to lack stereids. Contrary to the latter assertion, the marginal rib in leaves in the lectotype (Réunion, Rodriguez ’66’, PC) and other collections of *S. rodriquezii* often includes a strand of stereids (Fig. 9), particularly where the rib is well-developed. In this and all other respects the relatively short leaves in *S. rodriquezii* are indistinguishable from those found in small forms of *S. mahensis*.

*Syrrhopodon mahensis* Besch. is known from the Seychelles and Réunion Island (O’Shea, 2006). It is an extremely variable species, with shoots ranging from < 0.5 cm to > 7.0 cm high. The leaves vary from short (3-5 mm) and almost lingulate to long (5-15 mm) and narrowly lanceolate (abruptly narrowing from a broad base). Teeth and papillae, which characteristically adorn the leaves of this species, vary in their distribution, size and shape. Orbán (1995) proposed two formal varieties of *S. mahensis* to accommodate this plasticity of form. One of these, *S. mahensis* var. palmarum Orbán, is characterised (like *S. rodriquezii*) by

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1. A few, probably duplicate, collections of *S. rodriquezii* made by Rodriguez (PC), are labelled as coming from Mauritius. On most of these (in Hb. Renauld and Hb. Cardot) are annotations casting doubt on their provenance and suggesting Réunion Island as the more likely place of origin. The occurrence of *S. rodriquezii* [= *S. mahensis*] on Mauritius must presently remain in doubt.
Fig. 6-11. *Syrhopodon mahensis* Besch. var. *mahensis* (6-10) and *S. mahensis* var. *palmarum* Orbán (11). 6. Habit. 7. Leaf in ventral view. 8. Margin at shoulders of leaf (from either side of same leaf). 9, 10. Margin of chlorophyllose limb in cross-section. 11. Leaf in ventral view. (6 from Rodriguez s.n., PC; 7-9 from type of *S. rodriguezii*, PC; 10 from Norkett 18448A, BM; 11 from Norkett 16685A, BM).
the possession of relatively short leaves. It is described as possessing shoots 0.5-1.0 cm high, with lanceolate, shortly acute leaves, 3-5 mm long; the distal part of the leaf (chlorophyllose limb) being only slightly narrower than the proximal part (hyaline base). Along the margin adjacent to the apex of the hyaline base (leaf shoulders) an acute tooth is formed by “every second marginal cell”. This variety is based on material from Praslin Island, but appears to occur more generally in the Seychelles (e.g. Mahé, Norkett 16685A, BM has shoots and leaves of similar size and proportions (Fig. 11)).

*Syrrophodon rodriquezii* possesses leaves with a similar length to those in var. *palmarum*, but does not share its diminutive habit. The type and authentic material of *S. rodriquezii* has shoots reaching 2.5 (–3.0) cm high. Most leaves are about 4 mm long and have a broad hyaline base with a relatively narrow, lanceolate chlorophyllose limb (Fig. 7). Teeth at the margin of the leaf shoulders are variable in shape and distribution even on either side of a single leaf (Fig. 8). *S. rodriquezii* cannot be comfortably accommodated within *S. mahensis* var. *palmarum*.

A further notable feature of the type and some authentic material of *S. rodriquezii*, is the possession of long, densely packed shoots that hardly innovate below but often diverge near their apices into a few short, compact branches (Fig. 6). This pattern of growth appears a little unusual within *S. mahensis* generally and is not apparent in some other collections from Réunion Island. It may be a consequence of incidental environmental influences and provides no justification for treating *S. rodriquezii* as a distinct, named variety within *S. mahensis*. *Syrrophodon rodriquezii* Renaud & Cardot is best regarded as an anonymous short-leaved form of *Syrrophodon mahensis* Besch.

**Selection of specimens examined**


**Acknowledgments.** We are grateful to Claudine Ah-Peng and the curators in PC and H-BR for the loan of specimens. Brian O’Shea is thanked for his helpful comment on the manuscript for this paper.

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APPENDIX

Provisional list of taxa in *Macromitrium* and *Syrhopodon* known from Réunion Island. Modified from Ah-Peng & Bardat (2005).

*Bold print* = currently accepted name

E = Taxa considered endemic to Réunion Island

NB. Research on the taxa of *Syrhopodon* and *Macromitrium* occurring in Réunion Island continues and further alterations to this list are anticipated.

MACROMITRIUM (Orthotrichaceae)


*Macromitrium fasciculare* Mitt.

*Macromitrium fimbriatum* (P.Beauv.) Schwägr.

*Macromitrium gimalacii* Bizot & Onr. = *Macrocoma lycopodioides* (Schwägr.) Vitt

*Macromitrium mauritianum* Schwägr.

*Macromitrium orthostichum* Nees ex Schwägr.

*Macromitrium pallidum* (P.Beauv.) Wijk & Margad.

*Macromitrium rufescens* Besch. = *Macromitrium sulcatum* subsp. *sulcatum*

*Macromitrium scleropodium* Besch. = *Macromitrium orthostichum*

*Macromitrium serpens* (Bruch ex Hook. & Grev.) Brid.

*Macromitrium sulcatum* (Hook.) Brid. subsp. *sulcatum*

*Macromitrium voelizkowii* Broth.

SYRRHOPODON (Calymperaceae)

*Syrhopodon afric anus* (Mitt.) Paris var. *africanus*

*Syrhopodon albidus* Thwaites & Mitt. subsp. *integrifolius* (E.B.Bartram) L.T. Ellis

*Syrhopodon armatus* Mitt. subsp. *insularus* (Bizot & Onr.) Orbán & W.D.Reese

*Syrhopodon apertifolius* Besch. (Réunion Island and other Old World specimens misclassified as *Syrhopodon prolifer* var. *acanthoneuros* (Müll.Hal.) Müll.Hal.)

*Syrhopodon asper* Mitt.

*Syrhopodon crenulatus* (Tixier) W.D.Reese

*Syrhopodon gardneri* (Hook.) Schwägr.

*Syrhopodon gaudichaudii* Mont.

*Syrhopodon hispidocostatus* Renaud & Cardot

*Syrhopodon involutus* Schwägr.

*Syrhopodon mahensis* Besch. var. *mahensis*

*Syrhopodon mauritianus* Müll.Hal. ex Ångstr.

*Syrhopodon parasiticus* (Brid.) Besch.

*Syrhopodon pottioides* Orbán

*Syrhopodon prolifer* Schwägr.

*Syrhopodon prolifer* var. *acanthoneuros* (Müll.Hal.) Müll.Hal. (not on Réunion Island, see *S. apertifolius*)

*Syrhopodon prolifer* var. *hispidocostatus* (Renaud & Cardot) Orbán & W.D.Reese = *Syrhopodon hispidocostatus* Renaud & Cardot

*Syrhopodon prolifer* var. *seychellarum* Orbán = *Syrhopodon albidus* subsp. *integrifolius*

*Syrhopodon rodriguezii* Renaud & Cardot = *Syrhopodon mahensis* var. *mahensis*

*Syrhopodon rodriguezii* var. *sublaevis* Renaud & Cardot = *Syrhopodon mahensis* var. *mahensis*