A new contribution to the moss flora of the Inner Seychelles

(revised edition)

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Abstract: An updated list of the mosses of the Inner Seychelles is given based on the previous literature and collections of the first author in 2008. It includes data on the frequency of species as well as distributional data for the individual islands. The moss flora of the islands is characterized. *Campylopus brevirameus* Dixon is regarded as synonym of *C. julaceus* ssp. *arbogastii* (Renauld & Cardot) J.-P.Frahm. *Brachymenium dicranoides*, *Bryum alpinum, Campylopus flaccidus*, *C. flexuosus*, *Ectropothecium brachycladulum*, *E. chenagonii* and *E. perrotii* are reported as new to the Seychelles. *Garckea flexuosa*, *Syrrhopodon involutus* and *S. prolifer* are reported as new to La Digue, *Bryum leptospeiron*, *Brachymenium exile* and *Calymperes afzelii* as new to Praslin.

Introduction

The Republic of the Seychelles consists of 115 Islands, which are dispersed within 400.00 m^2 in the Indian Ocean. They are usually divided into the Inner and Outer Islands.

The Outer Islands comprise of the Amirantes; Alphonses; Farquhar Islands and Aldabra Islands. Only six species of mosses (*Calymperes motleyi*, *C. tenerum*, *Hyophila involuta*, *Isopterygium argyroleucum*, *Luisierella barbula*, *Trachyphyllum inflexum*) were collected on some of the Aldabra Islands (Grand Terre, Picard, Polymie, Malabar, Iles aux Cendres, Ile Esprit, Desroche).

The Inner Islands consists of 42 granitic islands and two coral islands (Bird Island, Denis Island). The granitic islands are part of the former Gondwana continent and have never been submerged during their geological history. After the split of the Gondwana continent, the Seychelles remained attached to India until 65 mya. At that time, the islands of North and Silhouette were raised. They are located on a 45–65 m deep shelf and were connected during the ice ages (Hill & Currie 2007). Amongst the granitic islands, Mahé, Praslin, Silhoutte and La Digue are the largest and the most visited ones by bryologists, the others are much smaller. Bryological collections have been done only on these larger islands as well as on Fregate and Denis.

A detailed list of the mosses of the Seychelles was presented by O´Shea et al (1996). This detailed flora with indication of the localities and collectors included 97 species, of which 15 are endemic. In the meantime, several smaller notes on the moss flora of the Seychelles were published recently (Bruggeman-Nannenga 1999, Een & Kristoferson 1999, O´Shea 1998, 2000a, 2000b, La Farge 2002, Ellis 2003, 2005). They were compiled by O'Shea (2006), and raised the number to 110. For comparison, the hepatic flora consists of 82 species (Grolle 1978) a number,

which has not been changed in the checklist of the East African Islands (Wigginton & Grolle 1996), and only raised later by Wigginton (2009) to 108 taxa. Compared with the moss flora of Mauritius, which includes 238 species (Frahm et al. in press), although O'Shea (2006) reported 253 mosses, this is a relatively small number, which cannot only be explained by a lower intensity of bryological exploration. Even the bryoflora of Mahé, the island with the highest species numbers, is poor. This concerns also the liverwort flora. Already Grolle (1978) made the interesting remark: "Eine Flora ist nicht nur durch die vorhandenen Taxa charakterisiert, sondern auch durch die fehlenden. Erstaunlich ist vor allem das völlige Fehlen der Marchantiales auf den Seychellen. Weiterhin fehlen *Lepidozia*, *Jungermannia*, *Porella*, *Isotachis*, *Jamesoniella*, *Chandonanthus*, *Gottschelia* und *Notoscyphus*, immerhin Gattungen, die in den Tropen Asiens und Afrikas vorkomen, z.Z. sogar artenreich." There is only one species of *Riccardia* or *Metzgeria*, and the tree trunks in the cloud forests are uniformly covered by ~~each~~ either one species of *Bazzania* or *Mastigophora*. The same concerns the mosses.

Both Mauritius and particularly the Seychelles have comparable elevations of up to 900 m. In contrast to the Seychelles, of which the larger islands are part of the Gondwana shield, Mauritius is a much younger volcanic island, which one would expect a much lower biodiversity. A lower species number in a much older archipelago corroborates the argument that islands are open for colonization by long distance dispersal. Since the lack of species especially concerns the higher altitudes, it could be speculated that the islands had a different, drier climate in previous geological ages and that the cloud forest developed relatively recently and bryophyte flora of the cloud forest was established by long distance dispersal of hitherto few species. The younger age of Mauritius is expressed in the apparent lack of endemic bryophyte species. In contrast, the Seychelles harbour — at the present state of knowledge — 4 endemic species: *Calymperes norketii*, *Fissidens jeffreyi*, *F. seychellensis*, and *Leucoloma seychellense*, plus four endemic varieties of Calymperaceae. A major difference is the size of the islands. The main islands of the Seychelles (Mahé, Praslin, La Digue) are between 10 and 142 square kilometres, whereas Mauritius is much larger (nearly 2000 km^2) although largely cultivated except for small areas (according to Wikipedia about 20% are forests and woodlands). There are also other groups of organisms with low species numbers. The avifauna consists of only 67 species, of which 28 are land bird species, of which nine are introduced (Hill & Currie 2007).

The species diversity between the islands of the Seychelles is much different; Table 1 shows an updated list of the mosses of the Seychelles and the distribution of species numbers on the islands. Most of the species are found on Mahé, which is the largest and highest island.

The bryophyte flora of the Seychelles is still insufficiently known. This is shown by the fact that Crosby et al. (1983) cited four species of *Fissidens* from the Seychelles, O´Shea et al. (1996) six and Bruggeman-Nannenga (1999) eleven, including one species new to science, but not including two species cited by O´Shea et al. (1996), a publication, which was not regarded by Bruggeman-Nannenga, which raises the total number to thirteen [cf. O'Shea 2006].

Table 1: Size, elevation and species numbers of mosses of the Inner Seychelles

	Mahé	**Praslin**	**Silhouette**	**La Digue**	**Fregate**
Max. elevation (m)	905	367	751	333	125
Square kilometres	142	38	20	10	ca. 2
Species of mosses	89	33	24	14	7

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The bryoflora of the islands

Denis
Denis Island is one of the two coral islands of the Inner Seychelles. Only *Calymperes tenerum*, *Hyophila involuta* and *Isopterygium argyroleucum* are known from this island.

Fregate
This island is one of the smallest and lowest granitic islands [2.19 km², 125 m high]. The first collection of mosses was made in 1997, which was identified and published by O´Shea (2000b). It includes *Calymperes erosum*, *Fissidens seychellensis*, *F. sciophilus*, *Isopterygium argyroleucum*, *Octoblepharum albidum*, *Syrrhopodon mahensis* and *S. prolifer*. Later Een & Kristoferson (1999) and Fisher (2006) added *Fissidens reflexus* and *Syrrhopodon revolutus* to the bryoflora respectively.

La Digue
Onraedt was the first bryologist who visited this island in 1974 for some hours. He did, however, not cite any moss from La Digue in his later publication (Onraedt 1994). De Sloover was apparently the first collector of bryophytes on this island. He (De Sloover 1995) gave the first list of bryophytes of the small island based in a three-weeks-stay on the island in 1983. Five species were already collected a year before by Onraedt (1994). He listed 13 mosses (*Barbula indica* (as *Semibarbula orientalis*), *Calymperes afzelii*, *C. erosum*, *C. palisotii*, *C. tenerum*, *Callicostella africana* (as *Schizomitrium africanum*), *Fissidens ceylonensis* (as *F. subceylonensis*), *F. pellucidus* (as *F. grandiretis*), *F. seychellensis*, *Hyophila involuta* (as *H. potieri*), *Isopterygium gracile*, *Octoblepharum albidum*, *Syrrhopodon mahensis*) and 8 hepatics (*Acrolejeunea emergens*, *Cheilolejeunea surrepens*, *Cololejeunea raduliloba*, *Frullania ericoides*, *Harpalejeunea filicuspes*, *Lopholejeunea abortiva*, *L. subfusca*, *Microlejeunea africana*) for the island. We could add *Brachymenium dicranoides, Garckea flexuosa*, *Syrrhopodon involutus* and *S. prolifer* to this island.

It seems as if the bryoflora has changed during the past decades. From past records, *Hyophila involuta* was only reported from two localities but is today one of the most common mosses growing on granite rocks, granite walls and concrete, especially at lower altitudes. The same counts for *Calymperes afzelii* which was formerly recorded from ten localities, whereas it is today the most common species on rocks and trees.

Silhouette
Although this island is the third largest and second highest, reaching an elevation of 751 m high and thus reaches the cloud forest, only 26 species of mosses are known from this island. The main reason is that there is only one small hotel and therefore the island is visited by boat usually only for day trips from Mahé, there are few roads and it is quite strenuous to climb one of the three mountains exceeding 500 m. Therefore Silhouette is still much in need of a more intensive bryological exploration.

Praslin
Praslin is larger than La Digue but not really higher. With maximum elevation of 367 m, it includes only the submontane belt, which implies a considerable reduction of species. Thirty species of mosses were found in Praslin, fourteen more than in La Digue. These include the same species as on La Digue with the exception of *Fissidens ceylonensis*. Additional species are *Calymperes couguiense*, *C. graeffeanum*, *C. hispidum*, *C. motleyi*, *C. norketii*, *Fissidens flaccidus*, *F. jeffreyi*, *F. marthae*, *F. zollingeri*, *Isopterygium argyrocleucum*, ~~Macohymenodon~~ *Macrohymenium acidodon*, *Mitthyridium fasciculatum* ssp. *cardotii* (as *M. micro-undulatum*), *Neckeropsis boiviniana*, *Serpotortella cyrtophylla*, *Taxithelum instratum*, and *T. planulum*. All the

species are typical lowland elements. The higher number of species may reflect a more intensive collecting by specialists, although this mostly concerned the Vallée de Mai National Park with its spectacular stands of *Lodoicea maldivica*. In fact Onraedt (1994), who collected 23 species on Praslin, visited only the Vallée de Mai and one beach (Anse St. Anne).

Mahé

Most of the species are known from Mahé. Reasons are that Mahé is the largest and highest island, and with Silhouette the only which reaches into the montane belt. In contrast to Silhouette, the montane region is easily accessible by a road. It is also the main island with the capital, harbour and airport, with the consequence that most collectors stayed here and thus most collecting was done on this island. Due to these facts, almost all mosses recorded for the Seychelles are found on Mahé with the exception of *Calymperes conguiense* (only Praslin), *Luisierella barbula* (only Grand Terre), *Papillaria africana* (only Silhouette), *Serpotortella cyrtophylla* (only Praslin and Silhouette), *Trachyphyllum inflexum* (Esprit), *Brachymenium dicranoides* (only La Digue), *Bryum alpinum* (only Praslin); *Callicostella africana* (only Praslin), *Fissidens reflexus* & *F. sciophyllus* (both only Fregate) and dubious records for the Seychelles, which are not attributed to any specific island (*Bryum capillare*, *Leucophanes octoblepharioides*, *Pelekium gratum*).

The most common species is *Hyophila involuta*. Although so far reported only ten times, it is absolutely abundant on rocks and walls along all roads, especially the roadside ditches made from concrete. The rarest species is *Polytrichum subpilosum*, which was only recorded in 1840 viz. 1841.

Mahé is by far moister as compared with Praslin and La Digue, which has an effect on the altitudinal zonation. The summit regions of the latter islands at about 300 m are much drier and have distinctly less bryophytes, both in terms of species numbers and abundance, as the same elevation on Mahé, where bryophytes contribute much to the aspect of the forests. The reason might be that the summits of Mahé catch clouds, which can be observed when the summits of Mahé are covered by clouds and it rains also at lower elevations (but not along the coast) whereas the clouds do not touch Praslin or La Digue and thus give no rain. The climate on Mahé is also moister because it is more densely covered by high forests because of steep slopes which were not cut. In the forest between 300 and 500 m, the boulders are covered by species of *Leucoloma*, *Leucophanes*, species of Sematophyllaceae and *Ectropothecium*. Above 500 m the mossiness increases by additional species such as *Porotrichum elongatum*, *Pyrrhobryum spiniforme*, *Mastigophora diclados* and species of *Bazzania* and *Plagiochila*. Although there is a relative high abundance of bryophytes, the diversity is conspicuously poor, boulders are predominately covered by one or two species, some rain forest genera such as *Lepidozia*, *Metzgeria* or *Trichocolea* are lacking. The mossiness culminates above 600 m, where the trees are densely wrapped by bryophytes. The only pendant moss is *Aerobryopsis longissima*, *Mastigophora* forms "moss"balls in the canopy as in Borneo at 2300 m, epiphylls are more frequent and "subalpine" elements such as *Herbertus grossevitatus* occur.

The systematic composition

Table 2 shows the numbers and percentages of the moss families on each individual island of the Seychelles. Silhouette is not included in the evaluation because of lack of knowledge due to under-collecting.

It is not surprising that Calymperaceae and Fissidentaceae are the families with the highest species numbers in the Seychelles, like in most other tropical lowlands. The next numerous families are – also as in other tropical lowland regions – Sematophyllaceae, Leucobryaceae and Hookeriaceae.

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Due to the lower altitude of the islands, the Calymperaceae count for about 35% of all mosses on Praslin and la Digue but only 20% on Mahé.

The altitudinal zonation

- The coastal plains (0–10 m) are covered with Mangrove and salt tolerant trees as well as coconut plantations and cultivated land.
- The submontane belt reaches from 10 to 500 m.
- The montane belt (>500 m) is reached only by Mahé and Silhouette.

The altitude shows a considerable effect on the species richness. At lower altitudes, suitable habitats such as roadside banks are not covered by bryophytes as it is at higher altitudes. Most of the few species occur in shady sites, epiphytic or on rocks. This phenomenon has not been fully understood. With regards to forest bryophytes, the combination of high temperature and low light intensity has been introduced as explanation (Frahm 1990).

Table 2: Systematic composition of the mosses of the Inner Seychelles

	Total (93)	Mahé (85)	Praslin (33)	Silhouette (20)	La Digue (14)
Calymperaceae	19 (20.4%)	18 (21.1%)	11 (33.0%)	5	5 (35.7%)
Dicranaceae	14 (15.0%)	14 (16.4%)	0	2	0
Fissidentaceae	13 (13.9%)	13 (15.2%)	7 (21.2%)	6	3
Sematophyllaceae	6 (6.4%)	8	0	1	0
Hypnaceae	5 (5.3%)	4	1	0	0
Leucobryaceae	4 (4.3%)	3	1	1	0
Pottiaceae	4 (4.3%)	2	3	0	2
Plagiotheciaceae	4 (4.3%)	4	2	0	1
Hookeriaceae	4 (4.3%)	4	1	2	1
Neckeraceae	3 (3,2%)	3	1	1	0
Orthotrichaceae	3 (3.2%)	3	0	0	0
Bryaceae	2 (2.1%)	2	0	0	0
Meteoriaceae	2 (2.1%)	3	0	2	0
Bartramiaceae	2 (2.1%)	2	0	0	0
Ditrichaceae	1 (1.0%)	1	1	0	0

This hypothesis was based on climate chamber experiments, which resulted in insufficient net photosynthesis. An explanation for the lack of bryophytes on open habitats at lower elevations is still missing. It could also be attributed to high temperatures, which are tolerated in dry but not wet conditions. Since the photosynthesis decreases above 25°C, the bryophytes reach no more net-photosynthesis in wet state. This hypothesis is supported that these equatorial lowland regions lack aquatic bryophytes.

List of localities

In September/October 2008, the author spent two weeks of holidays on Mahé, Praslin and La Digue, accompanied by the lichenologist Felix Schumm. During this trip, the following localities were visited:

1. Praslin, Anse la Blague, Umgebung Hotel La Vanille, 10m, 27.09.2008
2. Praslin,Vallée de Mai National Park, 140m, 28.09.2008
3. Praslin, Anse Volbert, Mündung des Cote d´Or River, Mangrove, 2m, 29.09.2008
4. Praslin, Curieuse Bay, Mündung des Pasquiere River No. 1, 2m, 29.09.2008
5. Praslin, Straße Anse Baudin – Zimbabwe, Straßenrand, 180m, 29.09.2008
6. Praslin, Zimbabwe, Regenwaldrest, 300m, 29.09.2008
7. Praslin, Anse Lazio, Kokosnusshain am Hotel Bon Plume, 2m, 29.09.2008
8. Praslin, Straße Anse Lazio – Anse Baudin,Waldrest, 25m, 29.09.2008
9. Praslin, Praslin National Park, Sentier Glacier Noir, 200–320m, 30.09.2008
10. Praslin,Weg von St. Maries Point zur Anse Lazio, 0–250m, 01.10.2008
11. Praslin, Praslin National Park, Weg von der Hauptstr., 170m, 01.10.2008
12. La Digue, NE-Küste, Anse Gaulette, 2m, 02.10.2008
13. La Digue, Aufstieg nach Belle Vue, 140m, 03.10.2008
14. La Digue, Pfad von Belle Vue nach Nid´Aigle, 250–300m, 03.10.2008
15. La Digue, Sentier Nid´Aigle, 300–330m, 03.10.2008
16. La Digue, Flycatcher Reserve,Tieflandswald, 10m, 04.10.2008
17. La Digue, Union Estate Kokos-Plantagen, 2m, 04.10.2008
18. Mahé, Missionruinen an der Straße Victoria – Port Glaud, 450m, 07.10.2008
19. Mahé, Sentier Trois Frères an der Straße Victoria – Port Glaud, 270–480m, 07.10.2008
20. Mahé, Morne Seychellois Nat. Park, Sentier de Copolia, 350–480m, 08.10.2008
21. Mahé, NW-Küste, Baye Ternay, Sonneratia Mangrove, 0m, 08.10.2008
22. Mahé, NW-Küste, Port Launay Estate,Wasserfall, 10m, 08.10.2008
23. Mahé, Morne Seychellois Nat. Park, Sentier Morne Blanc 450–667m, 09.10.2008
24. Mahé, Morne Seychellois Nat. Park, Beginn des Sentier Casse Dent 370–420 m, 10.10.2008
25. Mahé, Straße von La Misere zur USAF Satellitenstation 460 m, 10.10.2008
26. Mahé, Westküste, Barbarons Estate, Mangrove 0 m, 11.10.2008
27. Mahé, Westküste, Riviere Dauban, Mangrove board walk, 0 m, 11.10.2008

List of species

The collections are listed below. Species newly recorded for an island are marked with an asterisk. The new records are incorporated in an updated list of the mosses of the Seychelles (Table 3).

Acanthorrhynchium papillatum (Harv.) M. Fleisch. [*A. decolor, A. loucoubense*]
(19) on rock. The specimen, like most collections from Seychelles, has leaves with stronger marginal teeth as observed by O'Shea (1997).

Acroporium lamprophyllum Mitt. [*A. punctuliferum*]
(19) on rock. A widespread SE Asian - Sri Lankan species, which is easily recognised by the numerous slender penicillate branch tips. Our specimen fall within the form with more pronounced papillae on the leaf cells, which was formerly recognised as *A. punctuliferum* (Tan 1994).

Aerobryopsis cf. *capensis* (Müll. Hal.) M. Fleisch. [*Aerobryidium subpiligerum*]
(18) on rock.

Aerobryopsis longissima (Dozy & Molk.) M. Fleisch.
(25) on rock.

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Barbula indica (Hook.) Spreng.
(18) on wall of ruins.

**Brachymenium dicranoides* (Hornsch.) A. Jaeger
(13) on soil. New to the Seychelles.

**Brachymenium exile* (Dozy & Molk.) Bosch & Sande Lac.
(4) on road side. New to Praslin.

Brachymenium sp.
(23) on summit rock. Plants <1cm high, leaves lanceolate, costa red, strong, longly excurrent, leaf margin bordered by two cell rows. smooth, involute. Capsule pendent, longly cylindric, operculum conical with weak papilla.

**Bryum alpinum* Huds. ex With.
(5) on roadside bank. Plants lustrous, with wider juxtacostal cells and relatively long laminal cells. Costa percurrent. New to the Seychelles.

Bryum apiculatum Schwägr.
(18) on wall.

**Bryum leptospeiron* Müll. Hal.
(7) on sand in coconut plantation. New to Praslin.

Callicostella cf. *seychellensis* (Besch.) Renauld
(24) on shady rock with *Leucomium strumosum* and *Distichophyllum mascarenicum*.

**Calymperes afzelii* Sw.
(13) on tree trunk (14) on rocks and tree trunks. New to Praslin.

Calymperes erosum Müll. Hal.
(14, 14a) several times on rock and roots, (18) on base of tree, (25) on rock.

Calymperes graeffeanum Müll. Hal.
(18) on bark with Taxithelium instratum

Calymperes motleyi Mitt.
(4) epiphytic, (21) on Sonneratia mangrove tree.

Calymperes norkettii L.T. Ellis
(2) on trunk.

Calymperes palisotii Schwägr.
(3) epiphytic, (14) on rock.

Calymperes tenerum Müll. Hal.
(2) on palm, (3) in mangrove, (4, 12, 15) epiphytic, (14) on rock, (16) on Coconuts.

Campylopus
For descriptions of the species see Frahm (1985)
Basal laminal cells thin walled, hyaline

Leaves ending in a hair tip
Hair tip bent outwards……..…… *C. arcuatus*
Hair tip straight……..…… *C. julaceus* ssp. *arbogastii*
Leaf tips not ending in a hair tip
Basal laminal cells incrassate
Leaves ending in a hair tip or subhyaline point
Laminal cells oval ……..…*C. flaccidus*
Laminal cells rectangular ……..… *C. robillardei*
Leaf tips not ending in a hair tip
Plants with flagellate branches, plants > 1,5 cm
Transverse section of costa with ventral steroids … *C. arctocarpus* ssp. *madegassus*
Transverse section of costa with small ventral hyalocysts ……..…….. *C. flexuosus*
Plants without flagellate branches, plants < 1 cm …….....*C. nanophyllus*

Campylopus arcuatus (Brid.) A. Jaeger
(23) epiphytic and on rock.

Campylopus "*brevirameus*" Dixon
(19, 20, 23) on soil covered rock.
This species was described as an endemic from Mahé by Dixon based on a single collection. It was later regarded as hybrid between *C. pilifer* and *C. introflexus* by Frahm (1985) based on its intermediate characters. The species was re-established based on the numerous specimens collected by Porembski (O´Shea et al. 1996) on the granite plateaus which revealed that the specimens possessed unique set of characters such as a rounded leaf tip and flexuose hair tips.

The leaves resemble much to those of *C. julaceus* with blunt tips, oval upper laminal cells and hyaline basal laminal cells, and a broad costa with dorsal lamellae 1–2 cells high, but the plants are not julaceous and the hairtips are somewhat flexuose or also slightly recurved. In all localities, however, intermediates between both taxa were observed. Gametangia on the julaceous stems indicate that the julaceous plants are male plants. Julaceous male plants are also found in related species such as *C. introflexus*, *C. pilifer* and many species of subg. *Thysanomitrion*. Therefore *C. brevirameus* must be regarded as young or sterile plants of *C. julaceus* ssp. *arbogastii*.

**Campylopus flaccidus* Renauld & Cardot
(24) roadside bank. A small, stunted form but with typical combination of characters (hairpoints, elongate oval cells. nerve with side nerves, ventral stereids). New to the Seychelles. A tropical african species, from the East African islands so far only known from Madagascar.

**Campylopus flexuosus* (Hedw.) Brid.
(19, 20) on soil. New to the Seychelles. The species resembles much *C. arctocarpus* ssp. *madegassus* but differs by the ventral hyalocysts in transverse section of the costa, whereas the latter species has steroids. Both produce small flagelliferous branches.

Campylopus julaceus ssp. *arbogastii* (Renauld & Cardot) J.-P.Frahm
(19, 25) on soil over rock. Easily recognized by the julaceus foliate stems. Known from Souh Africa, Madagascar, Mauritius and Reunion. From the Seychelles formerly known only from two misidentified specimens.

Campylopus nanophyllus Müll. Hal. ex Broth.
(19) on wet soil with *C.* "*brevirameus*".

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Campylopus robillardei Besch.
(20) on top of Mt. Copolia on sand, (23) on soil, (24) on roadside bank.
The plants differ by the presence of side nerves.

Clastobryophilum bogoricum (Bosch & Sande Lac.) M. Fleisch.
(20) on rock.

Distichophyllum mascarenicum Besch.
(24) on shady rock, temporarily irrigated.

Ectropothecium was keyed out according to Hedenäs (2005). It is the only key available for this under-studied genus in Africa.

**Ectropothecium brachycladulum* Broth.
(8) on granite rock in forest.

**Ectropothecium chenagonii* Renauld & Cardot
(23) on tree trunk; (24) on soil.

**Ectropothecium perrotii* Renauld & Cardot
(19) on rock.

Fissidens
For a key to the species of the Seychelles see Bruggeman-Nannenga (1999).

Fissidens ceylonensis Dozy & Molk.
(8) on soil.

Fissidens crispulus Brid.
(25) on rocks in stream.

Fissidens marthae Cardot
(2) on rocks in stream.

Fissidens pellucidus Hornsch.
(9) on soil.

Fissidens seychellensis Dury & Onr.
(2, 14) on soil of trail banks.

Fissidens zollingeri Mont.
(2) on soil.

Garckea flexuosa (Griff.) Margad. & Nork. [*G. phascoides*]
(11, 13, 20) on bare soil along trail banks. New to La Digue.

Hyophila involuta (Hook.) A. Jaeger
Frequent and common on all islands especially in low and medium altitudes, over kilometres along the edges of roads, but also on granite plateaus (glacis, inselbergs) and even on top of Morne Blanc (dispersed by tourists on boots?).

Leucomium strumosum (Hornsch.) Mitt.
(24) mixed within *Distichophyllum mascarenicum* and *Callicostella* cf. *seychellensis*.

Leucophanes
Key for the species from the Seychelles adapted from Salazar Allen (1993)

Midleaf cells oblong to irregularly hexagonal with sinuose lateral walls ……..*L.glaucum*
Midleaf cells rhomboid to oblong with straight walls
Leaves narrowly lanceolate (10-15:1) ……*L. angustifolium*
Leaves narrowly to broadly lanceolate (6-13:1)
Leaves narrowly lanceolate. Midleaf hyalocysts rectangular ……*L. seychellarum*
Leaves broadly lanceolate. Midleaf hyalocysts irregularly hexagonal to rectangular……..... *L. octoblepharioides*

Leucophanes angustifolium Renauld & Cardot
(19, 24) on rock.

Leucophanes seychellarum Besch.
(2) on rock, (23) epiphytic.

Macromitrium pallidum (P. Beauv.) Wijk & Margad.
(23) on tree in summit region. Third record for the Seychelles.

Mitthyridium fasciculatum ssp. *cardotii* (M. Fleisch.) B.C. Tan & L.T. Ellis [*M. micro-undulatum*]
(2, 19, 20) on tree trunks.

Papillidiopsis mahensis (Besch.) O'Shea
(19) on rock.

Philonotis hastata (Duby) Wijk & Margad.
(22, 25), in waterfall, on wet rocks along stream.

Philonotis sp.
(25, 26) on wall and soil in a plantation. The costa of these specimens is excurrent, however, the plants may ultimately also belong to P. hastata.

Porotrichum elongatum (Welw. & Duby) A. Gepp
(23) on trunk 550 m.

Syrrhopodon
Key to the Seychelles species adapted from Orban & Reese (1986), with additions and modifications.

Leaves bordered by elongate cells
Leaves shoulders ciliate ……..*S. armatus*
Lead shoulders smooth
Cells between the upper and lower lamina pitted, orange red ….……..*S. croceus*
Cells between the upper and lower lamina not differentiated
Upper lamina shorter than lower lamina ……*S. involutus*
Upper lamina longer than lower lamina ……*S. prolifer*
Leaves without border of elongate cells ……...*S. mahensis*

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Syrrhopodon croceus Mitt.
(23) on soil.

Syrrhopodon involutus Schwägr.
(12) on soil covered rock. New to La Digue.

Syrrhopodon mahensis Besch.
(6, 9, 19) on tree trunk, (2) on coconut shell, (08) on palm trunk.

Syrrhopodon prolifer Schwägr.
(14) on rock.

Taxithelium instratum (Brid.) Broth.
(18) on bark with Calymperes graeffeanum; (20) on rotten wood.

Vesicularia cf. *albo-viridis* (Renauld) Broth.
(24) on wet rocks.

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Table 3: Updated list of the mosses of the Seychelles Dubious taxa (Bryum capillare, Campylopus nivalis, Hyophila lanceolata, Macrohymenium strictum, Racomitrium membranaceum) are omitted. Indicated are the numbers of collections per island based on O´Shea et al. (1996) plus collections made by the author plus O'Shea (2006). O'Shea 2006 counted (SEY: 110 taxa + ALD: 5 + AMI: 1 =) 109 excluding 3 vars of Syrrhopodon, but including 5 dubious records and one synonym in Campylopus. Seven are reported here as new plus one record from a recent publication (Syrrhopodon revolutus, Fisher 2006), hence 111 taxa in total excluding 3 vars of Syrrhopodon]

Taxa	?	Mahé	Praslin	La Digue	Silhouette	others
Acanthorrhynchium papillatum (*A. decolor, A. loucoubense*)		11			2	
Acroporium diminutum		1				
Acroporium lamprophyllum (*A. punctuliferum*)		5				
Acroporium megasporum (*Macrohymenium megasporum*)		5				
Aerobryopsis capensis (*Aerobryidium subpiligerum*)		4			1	
Aerobryopsis longissima (*A. wallichii*)	1	10			4	
Barbula indica	1	2	1	2		
Brachymenium dicranoides				1		
Brachymenium exile		1	1			Ile Therese
Bryum alpinum			1			
Bryum apiculatum	1	4				
Bryum leptospeiron		5	1		1	
Callicostella africana				1		
Callicostella brevipes		2				
Callicostella seychellensis		6	3			
Calymperes afzelii		7	1	5		
Calymperes couguiense			1			
Calymperes erosum	1	112	1	7	1	Fregate
Calymperes graeffeanum	1	9	1			
Calymperes hispidum		6	2		1	
Calymperes motleyi		9	4			Malabar, Polymie
Calymperes norkettii		11	3			
Calymperes palisotii		19	6	5		
Calymperes pallidum		4				
Calymperes taitense		2			1	
Calymperes tenerum	1	19	6	15		Malabar, Polymie, aus Cedres, Esprit, Picard, Grand Terres, Desroches,

						Denis
Campylopus arctocarpus		4				
Campylopus arcuatus		4				
Campylopus flaccidus		1				
Campylopus flexuosus		2				
Campylopus julaceus (C. *brevirameus*)	2	12				
Campylopus nanophyllus		2				
Campylopus robillardei		6				
Clastobryophilum bogoricum		7			1	
Cyclodictyon hildebrandtii		1				
Cyclodictyon vallis-gratiae		1			1	
Dicranella acroclada		1				
Dicranella polii		3				
Distichophyllum mascarenicum	1	5			1	
Ectropothecium brachycladulum		1				
Ectropothecium chenagonii		2				
Ectropothecium regulare		7				
Ectropothecium perrottii		1				
Ectropothecium seychellarum	1	7				
Ectropothecium squarrifolium		1				
Fissidens bistratosus		5				
Fissidens ceylonensis (subc.)		5	2	2		
Fissidens crispulus (*F. zippelianus*)		6				
Fissidens flaccidus		2	1			
Fissidens jeffreyi		3	1		2	
Fissidens marthae		?	?		?	
Fissidens minutus		3			2	
Fissidens pellucidus (*F. eriksonii, F. laxus*)		6	3	1		
Fissidens reflexus						Fregate
Fissidens sciophyllus						Fregate
Fissidens serratus		1				
Fissidens seychellensis		3	2	5	1	Fregate
Fissidens zollingeri		2	2		1	
Garckea flexuosa (*G. phascoides*)		1	1	1		
Himantocladium cyclophyllum	1	1				
Hyophila involuta		10	1	2		Malabar, Polyemie, Esprit, Picard, Grand Terre, Denis
Isopterygium argyroleucum	1	4	1			Denis, Fregate

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Isopterygium gracile		3	2	5		
Isopterygium subleptoblastum		1				
Leucoloma delicatulum (*L. convolutaceum*)		1				
Leucoloma dichelymoides		2				
Leucoloma isleanum	1	3				
Leucoloma longifolium		1				
Leucoloma seychellense	1	2				
Leucoloma sinuosulum		1				
Leucomium strumosum		4			1	
Leucophanes angustifolium		22			2	
Leucophanes glaucum		1				
Leucophanes octoblepharioides	1					
Leucophanes seychellarum	3	20	2			
Luisierella barbula						Grand Terre
Macrohymenium acidodon		2	1			
Macromitrium pallidum		3				
Macromitrium sclerodictyon		1				
Macromitrium subpungens	1	7				
Mitthyridium fasciculatum ssp. *fasciculatum*		9				
Mitthyridium fasciculatum ssp. *cardotii* (*M. micro-undulatum*)	1	12	2	1?		
Mitthyridium fasciculatum ssp. *obtusifolium*		6				
Neckeropsis boiviniana		1	1			
Octoblepharum albidum	2	18	3	1	2	Fregate
Papillaria africana					1	
Papillidiopsis mahensis (*Rhaphidostichum mahense*)		19			1	
Pelekium gratum (*Thuidium* gratum)	1					
Philonotis hastata		7				
Philonotis mauritiana		3			1	
Pinnatella mucronata		1				
Polytrichum subpilosum		1				
Porotrichum elongatum		3			3	
Pyrrhobryum spiniforme		5			1	
Radulina borbonica	1	1				
Serpotortella cyrtophylla			1		1	
Syrrhopodon albidus ssp. *integrifolius*		17	1			
Syrrhopodon armatus		3			1	
Syrrhopodon croceus		5				
Syrrhopodon hispidocostatus		2?				
Syrrhopodon involutus		5		1		
Syrrhopodon mahensis	1	49	7	1	5	Fregate

Syrrhopodon prolifer		22		1	Fregate
Syrrhopodon revolutus		3			Fregate
Taxithelium instratum		4	1		
Taxithelium planulum		2	1		
Trachyphyllum inflexum					Esprit
Trichosteleum debettei		1			
Trichosteleum stictum	1	6			
Vesicularia albo-viridis		1			
Vesicularia crassiramea		1			

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