

A Checklist of the Mosses of Belize

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Abstract. A survey of the limited literature on the mosses of Belize and an examination of various taxonomic revisions has been made, together with many recent collections giving rise to a list of 250 species and 13 varieties. Extensive nomenclatural changes have been made since the older contributions came into print, so that the present list will serve as a basis for future recording.

Introduction

Belize, formerly British Honduras, is a small country of almost 23,000 square km. bounded on the north by Mexico and on the south and west by Guatemala, while the full eastern length has a Caribbean seaboard. The greater part of the country, to the north and south-east, is hot and humid with abundant rivers and creeks, and several sizeable lagoons. Apart from the three main highways, access is only by lesser roads, many seasonal, or by boat. The moss flora of this ground is limited, with the same species continually recurring. To the south, however, is the Maya Mountains range and the detached section known as Mountain Pine Ridge. One spur of this range rejoices in the name of Mt. Mossy (970 m), though no bryophytes appear to have been recorded from here as yet. These

mountainous areas are, for a small country, relatively rich in mosses since they include limestone areas with damp caves.

Whittemore and Allen (1996) have produced a checklist of the liverworts and "hornworts" of Belize - the latter name for the *Anthocerotales* too familiarly identified with the phanerogamic genus *Ceratophyllum* to be easily used by British botanists. Following Townsend's brief visit to Belize in 1994, being at that time in ignorance of Allen's own extensive recent work in the country, the former had ideas of publishing a check-list of the mosses. After a letter to Allen, who had at that time no such intentions, it was eventually decided to prepare a joint list. Allen's moss material has added very considerably to a very basic list in view of his visit to Doyle's Delight (1,140 m), the highest point in the

country, in 1993, and a further expedition in early 1997 produced many further additions. The above hepatic check-list gives more detail on the vegetation of Belize and the geology of the Maya Mountains.

Some idea of how underexplored the country has been bryologically may be gauged by the fact that careful perusal of many taxonomic moss revisions as well as such regional moss floras as were available, particularly Sharp, Crum & Eckel (1994), has resulted in very few records additional to those of Bartram (1932, 1934), Steere (1934, 1938, 1946), and more recently Parker et al. (1993) and Matola (1995). However, the taxonomy and nomenclature of the earlier publications has changed so considerably that it is thought worthwhile to bring all these and the later records together so up-dated. Even on Townsend's brief visit, a two-week package with the British travel organisation Explore Worldwide, several species unrecorded for Belize were found.

Belize is divided into six administrative districts, from north to south Corozal District, Orange Walk District, Belize District (including the old capital, Belize City), Cayo District (with the new capital, Belmopan), Stann Creek District and Toledo District. An earliest published locality for each district is listed, with place of publication. It should be noted that this does not infer that only one locality for Belize was cited in this place listed - or even that the earliest collected specimen was chosen. Sometimes it will be that the most securely localised specimen has been selected. For example, specimens have been published by Steere under the localities "Big Fall" and "Big Fall Pine Ridge". There is a settlement called Big Falls by the Belize River south-west of Bermudian Landing, but there is thus apparently also a Big Fall (perhaps that at present called the "Thousand Foot Fall") on "Pine Ridge" (? Mountain Pine Ridge). Which is intended may be in doubt (see note on *Fissidens fontanus*), so that "Big Fall" alone has been avoided where possible.

In the list the above districts are abbreviated by the omission of the word "District".

Townsend is responsible for determination of his own collections unless otherwise shown, and these are in his private herbarium; Allen is responsible for others, which are in MO and BRH unless otherwise indicated. The list follows Allen (1994) and Whittimore & Allen (1996) in recording distribution by district only in interest of space. Further details are only given where there is doubt as to the district.

List of taxa

SPHAGNACEAE

Sphagnum auriculatum Schimp. **Cayo**, Mains 4012 (Steere, 1946). Neither this binomial nor the specimen cited is accounted for by Crum in Allen (1994). It may be *S. subsecundum* Nees ex Sturm var. *rufescens* (Nees, Hornsch. & Sturm) Hueb. or *S. trirameum* (see below), as the large taxa of the *Subsecunda* recorded from Belize. The specimen has not been located.

Sphagnum imbricatum Hornsch. ex Russ. **Cayo**, Mains 4015, (Steere, 1946). Noted by Crum in Allen (1994) in the wide view of the species. It was determined by Flatberg (1984) as subsp. *affine* (Ren. & Card.) Flatb.

Sphagnum perichaetiale Hampe **Cayo**, Lundell 4273 (Steere, 1938, as *S. erythrocalyx* Hampe).

Sphagnum strictum Sull. **Toledo**, Davidse & Brant 32262 (Crum in Allen, 1994).

Sphagnum subsecundum Nees ex Sturm var. *rufescens* (Nees, Hornsch. & Sturm) Hueb. **Cayo**, Bartlett 11651 (Crum in Allen, 1994)

Sphagnum trirameum Crum **Cayo**, Davidse & Brant 33111 (Crum in Allen, 1994).

FISSIDENTACEAE

det. R.A. Pursell

Fissidens angustifolius Sull. **Cayo**, Lundell 1974b (Steere, 1934), Mains 3830 p.p., (Pursell in Allen, 1994; the specimen of which this is part, Mains 3830, is so localised by Steere, 1946, as *F. brittonii* var. *percurrens*).

Fissidens asplenoides Hedw. **Toledo**, Allen

18708.

- Fissidens crispus* Mont. **Cayo**, Allen 18270.
Fissidens curvatus Hornsch. **Toledo**, Allen 18875
Fissidens diplopus Mitt.
 var. *diplopus*. **Cayo**, Allen 15074 (Pursell in Allen, 1994); **Toledo**, Allen 15346B (Matola, 1995).
 var. *wainioi* (C.Muell.hal.) Pursell **Cayo**, Allen 15074; **Toledo**, Allen 15361 (Pursell in Allen, 1994).
Fissidens dissitifolius Sull. **Cayo**, Allen 18298, Townsend 94/224 with *Plaubelia sprengelii*; **Toledo**, Allen 18757.
Fissidens dubius P.Beauv. **Toledo**, Allen 19055.
Fissidens elegans Brid. **Cayo**, Mains 4120 (Steere, 1946, as *F. leptopodus* Card.); **Belize**, Townsend 94/127; **Toledo**, Allen 18787.
Fissidens flaccidus Mitt. **Toledo**, White s.n. (Bartram, 1934, as *F. hookeriaceus* (C.M.) Par., fide R.A. Pursell); **Cayo**, Allen 18262, Townsend 94/201.
Fissidens fontanus (B.Pyl.) Steud. Big Fall, **Belize?**, Lundell 1969 (Steere, 1934, as *Octodiceras julianum* (Savi ex Lam & DC.) Brid.). Big Falls, lower Belize R., may be more likely than Cayo District (as given by Pursell in Allen, 1994), as this moss tends to prefer slow-moving, somewhat polluted water.
Fissidens guianensis Mont. **Toledo**, White s.n. (Bartram, 1934, as *F. garberi* Lesq. & James, fide R.A. Pursell).
Fissidens juruensis Broth.
 var. *percurrans* (Grout) Pursell **Cayo**, Mains 3830 (Steere, 1946, as *F. brittonii* Grout var. *percurrans* Grout).
Fissidens minutus Thwaites & Mitt. **Toledo**, Boutin & Schlosser 5156 (Pursell in Allen, 1994); **Belize**, Allen 19088; **Cayo**, Gentle 1833a (Steere, 1938, as *F. pusillissimus* Steere; Pursell in Allen, 1994, as *F. minutus* var. *pusillissimus* (Steere) Pursell).
Fissidens neglectus Crum **Toledo**, Allen 15477 (Pursell in Allen, 1994).
Fissidens oblongifolius Hook. & Wils. **Toledo**, Allen 18609, 18610A.
Fissidens pellucidus Hornsch. **Cayo**, Allen 15111 (Pursell in Allen, 1994); **Toledo**, Al-

len 15357 (Matola, 1995).

- Fissidens polypodioides* Hedw. **Cayo**, Allen 15049 (Pursell in Allen, 1994); **Toledo**, Allen 15356 (Matola, 1995).
Fissidens radicans Mart. **Cayo**, Mains 3669 (Steere, 1946); **Belize**, Robertson s.n. (Bruggeman-Nannenga & Pursell, 1990); **Toledo**, Allen 18694.
Fissidens santa-clarensis Thér. **Corozal**, Balick et al. 2206 (Pursell in Allen, 1994, as *F. allenianus* Bruggeman-Nannenga & Pursell); **Belize**, Robertson s.n. (Bruggeman & Pursell, 1990, as *F. allenianus*); **Cayo**, Townsend 94/164; **Toledo**, Allen 18536.
Fissidens scariosus Mitt. **Cayo**, Allen 15102 (Pursell in Allen, 1994); **Toledo**, Allen 15354 (Matola, 1995).
Fissidens serratus C.Muell.hal. **Belize**, Allen 19077; **Cayo**, Mains 3840 (Steere, 1946, as *F. donnellii* Aust.); **Toledo**, Allen 18536A.
Fissidens steerei Grout **Toledo**, Robertson s.n. (Pursell in Allen, 1994); **Cayo**, Allen 18452.
Fissidens weirii Mitt.
 var. *weirii*. **Cayo**, Allen 15163 (Pursell in Allen, 1994); **Toledo**, Allen 15509 (Matola, 1995).
 var. *hemicraspedophyllus* (Card.) Pursell. **Cayo**, Allen 15228B (Pursell in Allen, 1994).
Fissidens yucatanensis Steere. **Orange Walk**, Townsend 94/106, 94/114.
Fissidens zollingeri Mart. Cohune Ridge, **Cayo**, Mains 3830A (Steere, 1946, as *F. kegelianus* C.Muell.hal.); **Orange Walk**, Townsend 94/121; **Belize**, Allen 19090, Townsend 94/148; **Toledo**, Allen 18617.

DICRANACEAE

- Campylopus angustiretis* (Aust.) Sull. & James. **Toledo**, Gentle 4132 (Allen, 1994).
Campylopus arctocarpus (Hornsch.) Mitt. **Cayo**, Allen 15229 (Allen, 1994); **Toledo**, Allen 15485 (Matola, 1995).
Campylopus asperifolius Mitt. **Belize**, Davidse & Brant 32958 (Allen, 1989).
Campylopus pilifer Brid. **Cayo**, Mains 4068 (Steere, 1946, as *C. introflexus* (Hedw.) Brid.); **Toledo**, Davidse & Brant 32180 (Allen, 1989).

- Campylopus savannarum* (C.Muell.hal.) Mitt. **Cayo**, Bartlett 12973 (Bartram, 1932, as *C. bartlettii* Bartr. sp. nov., fide Allen, 1989; syn. *C. savannarum* ssp. *bartlettii* (C.M.) Florschütz).
- Campylopus subcuspidatus* (Hampe) Jaeg. **Stann Creek**, Stevenson 3 (Allen, 1989).
- Campylopus surinamensis* C.Muell.hal. **Orange Walk**, Davidse & Brant 32733; **Toledo**, Gentle 3840 (Allen, 1989); **Belize**, Allen 17959; **Cayo**, Allen 18238, Townsend 94/193; **Stann Creek**, Townsend 94/259.
- Campylopus tallulensis* Sull. & Lesq. ex Sull. **Cayo**, Davidse & Brant 33056A
- Dicranella hilariana* (Mart.) Mitt. **Toledo**, Robertson s.n. (Allen, 1994); **Cayo**, Allen 18214, Townsend 94/222, 223.
- Holomitrium arboreum* Mitt., **Cayo**, Bartlett 11691 (Bartram, 1932 as *H. calycinum* (Hedw.) Mitt.); **Toledo**, Gentle 6499 (Allen, 1990).
- Leucoloma cruegerianum* (C.Muell.hal.) Jaeg. **Cayo**, Bartlett 11708, 11721, 11735 (Bartram, 1932); **Toledo**, White s.n. (Bartram, 1934).
- Leucoloma mariei* Besch. **Toledo**, Davidse & Brant 31933 (Allen, 1994).
- Leucoloma serrulatum* Brid. **Cayo**, Gentle 9186; **Toledo**, Davidse & Brant 32286 (Allen, 1994).
- Leucoloma tortellum* (Mitt.) Jaeg. **Cayo** (Steere, 1946); **Toledo**, Whittemore 5653 (BRH, MO).
- Microcampylopus leucogaster* (C.Muell.hal.) Allen. **Cayo**, Davidse & Brant 33056 (Allen, 1994); **Toledo**, Allen 15380 (Matola, 1995).
- LEUCOBRYACEAE
- Leucobryum antillarum* Schimp. ex Besch., **Cayo**, Mains 4010b (Steere, 1946); **Toledo**, Allen 15378 (Matola, 1995).
- Leucobryum crispum* C.Muell.hal. **Cayo**, Davidse & Brant 33112 (Allen, 1994).
- Leucobryum incurvifolium* C.Muell.hal. **Cayo**, Bartlett 11634, 11690 (Bartram, 1932, as *L. albidum* (Brid.) Lindb., including f. *subulifolium* Bartr. f. nov.)
- Leucobryum martianum* (Hornsch.) Hampe ex C.Muell.hal. **Cayo**, Allen 15065 (Matola, 1995); **Toledo**, Allen 18800.
- Leucobryum polakowskyi* (C.Muell.hal. ex Besch.) Card. **Cayo**, Davidse & Brant 33086; **Toledo**, Davidse & Brant 32252 (Allen, 1994).
- Octoblepharum albidum* Hedw. **Cayo**, Bartlett 11228, 11692, 12297 (Bartram, 1932); **Corozal**, Davidse & Brant 32516A; **Toledo**, White s.n. (Bartram, 1934); **Orange Walk**, Lundell 700; **Belize**, Gentle 1226 (Steere, 1938).
- Octoblepharum cocuiense* Mitt. **Cayo**, Bartlett 11641 (Bartram, 1932, as *O. mittenii* Jaeg., fide Salazar Allen in Allen, 1994); **Toledo**, Allen 18844A.
- Octoblepharum cylindricum* Schimp. ex Mart. **Cayo**, Bartlett 12972 (Bartram, 1932).
- Octoblepharum erectifolium* Mitt. ex Williams. **Cayo**, Allen 15057 (Salazar Allen in Allen, 1994); **Toledo**, Allen 19010.
- Octoblepharum pulvinatum* (Dozy & Molk.) Mitt. **Cayo**, Bartlett 12030 (Bartram, 1932); **Orange Walk**, Lundell 695; **Belize**, Gentle 112 (Steere, 1938); **Stann Creek**, Gentle 3279 (Steere, 1946); **Toledo**, Boutin & Schlosser 5019 (Salazar Allen in Allen, 1994).
- LEUCOPHANACEAE
- Leucophanes molleri* C.Muell.hal. **Toledo**, Allen 18775
- CALYMPERACEAE
- Calymperes afzelii* Sw. **Toledo**, White s.n. (Bartram, 1934); **Cayo**, Mains 3764, Gentle 3888 (Steere, 1946); All as *C. donnellii* Aust.; **Belize**, Allen 19074; **Stann Creek**, Townsend 94/277.
- Calymperes erosum* C.Muell.hal. **Stann Creek**, Gentle 1937 (Steere, 1946, as *C. disciforme* C.Muell.hal.); **Toledo**, Davidse & Brant 31884 (Reese in Allen, 1994); **Belize**, Allen 17968.
- Calymperes levyanum* Besch. **Cayo**, Allen 18319.
- Calymperes lonchophyllum* Schwaegr. **Cayo**, Bartlett 11738 (Bartram, 1932); **Orange**

- Walk**, Lundell 695; **Belize**, Gentle 1227 (Steere, 1938); **Toledo**, White s.n. (Bartram, 1934).
- Calymperes palisotii* Schwaegr. **Belize**, Gentle 931; **Cayo**, Gentle 1518 (Steere, 1938, as *C. richardii* C.Muell.hal.); **Orange Walk**, Davidse & Brant 32732 (Reese in Allen, 1994); **Stann Creek**, Townsend 94/258, 94/271.
- Calymperes nicaraguense* Ren. & Card. **Toledo**, White s.n. (Bartram, 1934); **Cayo**, Mains 3915; **Stann Creek**, Gentle 3531 (Steere, 1946); **Belize**, Allen 17978.
- Syrrhopodon automaius* Reese. **Cayo**, Allen 15059; **Toledo**, Allen 15469 (Reese in Allen, 1994).
- Syrrhopodon circinatus* (Brid.) Mitt. **Toledo**, Gentle 4415 (Reese in Allen, 1994).
- Syrrhopodon gaudichaudii* Mont. **Cayo**, Allen 15251C; **Toledo**, Davidse & Brant 31932 (Reese in Allen, 1994).
- Syrrhopodon graminicola* Williams. **Cayo**, Mains 3982 (Steere, 1946).
- Syrrhopodon incompletus* Schwaegr.
var. *incompletus*. **Cayo**, Bartlett 12031, 12085 (Bartram, 1932); Big Fall, ? **Belize**, Lundell 1962b (Steere, 1934); **Orange Walk**, Lundell 696; **Belize**, Gentle 113 (Steere, 1938); **Corozal**, Davidse & Brant 32558; **Stann Creek**, Schipp 8120; **Toledo**, Gentle 7476 (Reese in Allen, 1994).
var. *berteroanus* (Brid.) Reese. **Cayo**, Allen 15255; **Stann Creek**, Gentle 3279; **Toledo**, Allen 15419 (Reese in Allen, 1994).
- Syrrhopodon lycopodioides* (Brid.) C.Muell.hal. **Toledo**, Allen 15381 (Reese in Allen, 1994).
- Syrrhopodon parasiticus* (Brid.) Besch. **Cayo**, Mains 3645 (Steere, 1946); **Toledo**, Allen 18944.
- Syrrhopodon prolifer* Schwaegr.
var. *cinchnatus* (Hampe) Reese. **Toledo**, Davidse & Brant 31891 (Reese in Allen, 1994).
var. *prolifer* **Cayo**, Allen 18219.
var. *scaber* (Mitt.) Reese. **Cayo**, Allen 15112 (Reese in Allen, 1994); **Toledo**, Allen 15352 (Matola, 1995)
var. *tenuifolius* (Sull.) Reese. **Cayo**, Mains 3976b (Steere, 1946, as *S. tenuifolius* (Sull.) Mitt .)
- Syrrhopodon tortilis* Hampe. **Cayo**, Mains 3929 (Steere, 1946, as *S. prolifer* Schwaegr.). Reese (in Allen, 1994), cites one of the two specimens listed under *S. prolifer* by Steere (Mains 3929) as *tortilis*; the other (Mains 3904) presumably also belongs here, since it is not cited under *S. prolifer* by Reese, who does not include Belize in the distribution of var. *prolifer*.

POTTIACEAE

- Anoetangium aestivum* (Hedw.) Mitt. **Cayo**, Allen 18330.
- Barbula agraria* Hedw. **Orange Walk**, Townsend 94/116; **Belize**, Allen 19092B, Townsend 94/130, 94/136.
- Barbula arcuata* Griff. **Cayo**, Allen 18352, Townsend 94/171; **Toledo**, Allen 18867.
- Barbula ehrenbergii* (Lor.) Fleisch. **Belize**, Lundell 1965 (Steere, 1934); **Cayo**, Gentle 1528 (Steere, 1938). Both as var. *mexicana* Thér.
- Barbula indica* (Hook.) Spreng. ex Steud. **Belize**, Lundell 1986 (Steere, 1934); limestone cliff, Belize R., ? **Cayo**, Mains 3520 (Steere, 1946). Both as *B. cruegeri* Sond. ex C.Muell.hal.; **Orange Walk**, Townsend 94/100; **Cayo**, Townsend 94/155, 94/180.
- Eucladium verticillatum* (Brid.) B., S. & G. **Cayo**, Allen 18053.
- Gymnostomum aeruginosum* Sm. **Cayo**, Allen 18042.
- Hymenostylium recurvirostre* (Hedw.) Dix. **Cayo**, Allen 18339; **Toledo**, Allen 18866.
- Hyophila involuta* (Hook.) Jaeg. **Toledo**, White s.n. (Bartram, 1934); **Corozal**, Gentle 766 (Steere, 1938); **Cayo**, Mains 3981 (Steere, 1946). All as *Hyophila tortula* (Schwaegr.) Hampe; **Belize**, Townsend 94/129, 94/138.
- Luisierella barbula* (Schwaegr.) Steere. **Cayo**, Mains 3732 (Steere, 1945); **Belize**, Townsend 94/131.
- Oxystegus tenuirostris* (Hook. & Tayl.) A.J.E. Smith **Cayo**, Allen 18437; **Toledo**, Allen 18872.
- Plaubelia sprengelii* (Schwaegr.) Zand. **Corozal**, Gentle 568 (Steere, 1938 as *Desmatodon garberi* Lesq. & James); limestone cave, margin of Belize R., ? **Cayo**,

Mains 3522 (Steere, 1946, as *Desmatodon sprengelii* (Schwaegr.) R.S. Williams); **Cayo**, Townsend 94/195, 94/216.

Pseudosymblepharis schimperiana (Par.) Crum. **Toledo**, Allen 18505.

Tortella mollissima Broth. **Cayo**, Mains 3901a (Steere, 1946).

Tortella richardsii Bartram. **Cayo**, Mains 3844 (Steere, 1946).

Zander (1993) combines the last two species under *Pseudosymblepharis schimperiana*.

Tortella tortuosa (Hedw.) Limpr. **Cayo**, Allen 18426; **Toledo**, Allen 18868.

Trichostomum brachydontium Bruch **Cayo**, Allen 18260.

Trichostomum crispulum Bruch **Cayo**, Allen 18099.

Trichostomum portoricense Crum & Steere **Cayo**, Townsend 94/150, 94/156, det. Zander e dupl.

Weissia controversa Hedw. **Cayo**, Mains 4066 (Steere, 1946); **Toledo**, Allen 18655.

Weissia jamaicensis (Mitt.) Grout. **Orange Walk**, Townsend 94/110; **Cayo**, Allen 18187, Townsend 94/158, 94/214.

SPLACHNOBRYACEAE

Splachnobryum obtusum (Brid.) C.Muell.hal. **Orange Walk**, with *Barbula indica*, Townsend 94/101.

FUNARIACEAE

Funaria hygrometrica Hedw.
var. *calvescens* (Schwaegr.) Mont. **Cayo**, Bartlett 11851 (Bartram, 1932, as *F. calvescens* Schwaegr.).

EPHEMERACEAE

Ephemerum spinulosum Bruch & Schimp. **Belize**, Allen 19082, 19094.

BRYACEAE

Brachymerium klotzschii (Schwaegr.) Par. **Cayo**, Mains 3893; **Stann Creek**, Gentle

3161 (Steere, 1946, as *B. macrocarpum* Card.).

Brachymerium spirifolium (C.Muell.hal.) Jaeg. **Toledo**, Allen 18761.

Brachymerium wrightii (Sull.) Broth. **Toledo**, Allen 15452 (Matola, 1995).

Bryum apiculatum Schwaegr. **Belize**, Gentle 1376 (Steere, 1938, as *Pohlia cruegeri* (Hampe) Andr.); **Cayo**, Allen 18205.

Bryum billardieri Schwaegr. **Cayo**, Bartlett 11898a (Bartram, 1932, as *B. andicola* Hook.) **Toledo**, Allen 18560.

Bryum capillare Hedw. **Toledo**, Allen 15453 (Matola, 1995).

Bryum coronatum Hedw. **Cayo**, Allen 18182.

Bryum dichotomum Hedw. **Cayo**, Allen 18174.

Bryum pseudocapillare Besch. **Cayo**, Allen 18092; **Toledo**, Allen 18541.

Bryum renauldii Roell. ex Ren. & Card. **Cayo**, Allen 18416.

Rhodobryum beyrichianum (Hornsch.) Par. **Cayo**, Lundell 2730 (Steere, 1946).

DREPANOPHYLLACEAE

Mniomalia viridis (Mitt.) C.Muell.hal. **Toledo**, White s.n. (Bartram, 1934).

BARTRAMIACEAE

Philonotis hastata (Duby) Wijk & Marg. **Cayo**, Allen 18295.

Philonotis uncinata (Schwaegr.) Brid. **Cayo**, Lundell 2010 (Steere, 1934, as “*P. tenella* (C.Muell.hal.) Besch.”); ? **Belize**, Mains 3521 (Steere, 1946, also as *P. tenella*). **Toledo**, Davidse & Brant 32313 (MO). The binomial used by Steere does not occur in Index Muscorum. Since the presumed “basionym” *Bartramia tenella* C.Muell.hal is identical with *P. uncinata*, these specimens were presumed to belong to that species – a view now confirmed by Allen by examination of duplicates of both gatherings in US. *P. uncinata* has been gathered in further localities in **Cayo** and **Belize** Districts by both authors.

RHIZOGONIACEAE

Pyrrhobryum spiniforme (Hedw.) Mitt. **Cayo**, Allen 15068; **Toledo**, Allen 15504 (Matola, 1995).

ORTHOTRICHACEAE

Groustiella apiculata (Hook.) Crum & Steere. **Cayo**, Allen 15136 (Matola, 1995).

Groustiella chimborazensis (Spruce ex Mitt.) Florschütz.

subsp. *chimborazensis* **Cayo**, Allen 15133 (Matola, 1995).

subsp. *reesei* Vitt **Cayo**, Allen 18044.

Groustiella mucronifolia (Hook. & Grev.) Crum & Steere. **Belize**, Lundell 1985 (Steere, 1934, as *Macromitrium mucronifolium* (Hook. & Grev.) Schwaegr.); **Cayo**, Mains 3542 (Steere, 1946, also as *Macromitrium mucronifolium*). Perhaps another species of the genus, which is under revision by Dr. B. Goffinet of DUKE. **Cayo**, Allen 15054; **Toledo**, Allen 15454 (Matola, 1995).

Groustiella tomentosa (Hornsch.) Wijk & Marg. **Cayo**, Mains 3796 (Steere, 1946, as *Micromitrium fragile* (Mitt.) Jaeg.); **Toledo**, Allen 18803.

Macromitrium cirrosum (Hedw.) Brid. **Cayo**, Bartlett 11734 (Bartram, 1932); **Stann Creek**, Gentle 3161d (Steere, 1946). (Both sphalm. “*cirrhosum*”); **Toledo**, Allen 15502 (Matola, 1995); **Belize**, Allen 17956.

Macromitrium contextum Hampe **Toledo**, Holst 4340 (Holst in Parker et al., 1993); **Cayo**, Allen 18424.

Macromitrium leprieurii Mont. **Stann Creek**, Gentle 3161d (Steere, 1946, as *M. vernicosum*) **Toledo**, Allen 18985.

Macromitrium punctatum (Hook. & Grev.) Brid. **Cayo**, Bartlett 11692a, 11693 (Bartram, 1932, as *M. pentastichum* C.M.); **Toledo**, Allen 18634.

Schlotheimia rugifolia (Hook.) Schwaegr. **Cayo**, Bartlett 13047 (Bartram, 1932); Maskall, **Belize**, Gentle 1306a (Steere, 1938). Both as *S. mohriana* C.Muell.hal.; **Toledo**, Allen 18777.

Schlotheimia torquata (Hedw.) Brid. Valentin, **Cayo**, Mains 3625 (Steere, 1946); **Toledo**,

Allen 18927.

Groustiella tumidula (Mitt.) Vitt **Orange Walk**, Townsend 94/102; **Belize**, Allen 19093; **Cayo**, Allen 18489, Townsend 94/160, 94/163, 94/247; **Toledo**, Allen 19068.

HELICOPHYLLACEAE

Helicophyllum torquatum (Hook.) Brid. **Cayo**, Bartlett 13136 (Bartram, 1932).

LEUCODONTACEAE

Henicodium geniculatum (Mitt.) Buck **Cayo**, Bartlett 12044, 13094 (Bartram, 1932, as *Leucodontopsis floridana* (Aust.) E.G. Britt.); **Belize**, Allen 17966.

Pseudocryphaea domingensis (Spreng.) Buck. **Cayo**, Mains 3549 (Steere, 1946, as *P. flagellifera* (Brid.) E.G. Britt.)

PRIONODONTACEAE

Prionodon densus (Swartz ex Hedw.) C.Muell.hal. **Cayo**, Allen 15069; **Toledo**, Allen 15366 (Matola, 1995).

PTEROBRYACEAE

Hildebrandtiella guyanensis (Mart.) Buck. **Cayo**, Mains 3750 (Steere, 1946, as *Orthostichidium pentagonum* (Hampe) C.Muell.hal.); **Toledo**, Allen 18900.

Jaegerina scariosa (Lor.) Arzeni. **Cayo**, Allen 18444A, Townsend 94/206.

Orthostichopsis tetragona (Hedw.) Broth. **Cayo**, Bartlett 11736 (Bartram, 1932); Little Cocquericot, ? **Belize**, Lundell 4099; **Orange Walk**, Lundell 693; **Belize**, Gentle 1009 (Steere, 1938); **Toledo**, Gentle 3848; **Stann Creek**, Gentle 3048 (Steere, 1946).

Pirella angustifolia (C.Muell.hal.) Arzeni. **Orange Walk**, Lundell 701a (Steere, 1938, as *Pterobryum angustifolium* (C.Muell.hal.) Mitt.); **Cayo**, Allen 15266 (Matola, 1995); **Toledo**, Holst 4337 (Holst in Parker et al., 1933).

Pirella cymbifolia (Sull.) Card. **Toledo**, White s.n. (Bartram, 1934); **Cayo**, Lundell 1978b (Steere, 1934); **Orange Walk**, Lundell 701b;

Belize, Gentle 1229 (Steere, 1938); **Stann Creek**, Gentle 3531 (Steere, 1946).
Pireella mariae (Card.) Card. **Cayo**, Allen 15040 (Matola, 1995).
Pireella pachyclada (Ren. & Card.) Card. **Cayo**, Mains 3617 (Steere, 1946).
Pireella papillosula (Ren. & Card.) Card. **Cayo**, Mains 3763A (FH); Townsend 94/197. Det. Angela Newton (both).
Pireella pohlii (Schwaegr.) Card. **Cayo**, Allen 18384.
Pireella pycnothalloides (C.Muell.hal.) Fleisch. **Cayo**, Allen 18189.

METEORACEAE

Pilotrichella flexilis (Swartz ex Hedw.) Aongstr. **Cayo**, Allen 15238; **Toledo**, Allen 15398 (Matola, 1995).
Pilotrichella pentasticha (Brid.) Wijk & Marg. **Cayo**, Mains 3548 (Steere, 1946, as *P. pulchella* Schimp.); **Toledo**, Holst 4515 (Holst in Parker et al., 1993).
Squamidium isocladum (Ren. & Card.) Broth. **Cayo**, Allen 15534; **Toledo**, Allen 15298B (Matola, 1995).
Squamidium macrocarpum (Spruce ex Mitt.) Broth. **Toledo**, Allen 18788.
Squamidium nigricans (Hook. in Kunth) Broth. **Cayo**, Allen 15161 (Matola, 1995); **Toledo**, Allen 18705.
Meteorium illecebrum Sull. **Cayo**, Allen 15138; **Toledo**, Allen 15375 (Matola, 1995).
Papillaria deppei (Hornsch. ex C.Muell.hal.) Jaeg. **Cayo**, Allen 15080; **Toledo**, Allen 15335 (Matola, 1995).
Papillaria nigrescens (Sw.) Jaeg. **Cayo**, Bartlett 13046, 13047a (Bartram, 1932); Big Fall, ? **Belize**, Lundell 1956; **Stann Creek**, Gentle 2140 (Steere, 1946); **Toledo**, Allen 18647.
Zelometeorium patulum (Hedw.) Manuel. **Orange Walk**, Lundell 692; **Belize**, Gentle 1165; **Cayo**, Gentle 1832 (Steere, 1938); **Stann Creek**, Gentle 2725 (Steere, 1946). All as *Meteoriopsis patula* (Hedw.) Broth.; **Toledo**, Allen 18606.
Zelometeorium recurvifolium (Hornsch. in Mart.) Manuel. **Toledo**, Allen 15426 (Matola, 1995).
Meteoridium remotifolium (C.Muell.hal.) Ma-

nuel. **Toledo**, White s.n. (Bartram, 1934); Valentin, **Cayo**, Mains 3555 (Steere, 1946). Both as *Meteoriopsis remotifolia* (C.Muell.hal.) Broth.

PHYLLOGONIACEAE

Phyllogonium viride Brid. **Toledo**, Holst 4336 (Holst in Parker et al., 1993); **Cayo**, Allen 15045 (Matola, 1995). Both as *P. fulgens* (Hedw.) Brid.; redet. fide Allen.

NECKERACEAE

Homalia defoliata (C.Mull.hal.) Jaeg. **Cayo**, Allen 15193 (Matola, 1995).
Homalia glabella (Hedw.) Mitt. **Cayo**, Mains 3913c (Steere, 1946); **Toledo**, Holst 4338B, 4339 (Holst in Parker et al., 1993).
Neckeropsis disticha (Hedw.) Fleisch. **Cayo**, Bartlett 13146 (Bartram, 1932); **Toledo**, White s.n. (Bartram, 1934); **Stann Creek**, Gentle 2144 (Steere, 1946).
Neckeropsis foveolata (Mitt.) Broth. **Cayo**, Allen 18302, Townsend 94/205.
Neckeropsis undulata (P.Beauv.) Broth. **Toledo**, White s.n. (Bartram, 1934); **Cayo**, Lundell 1977 (Steere, 1934); **Orange Walk**, Lundell 692 (Steere, 1938); **Stann Creek**, Gentle 2144 (Steere, 1946); **Belize**, Townsend 94/134.
Pinnatella minuta (Mitt.) Broth. **Cayo**, Mains 3681a (Steere, 1946).
Porotrichum brevifolium Bartram **Toledo**, Whittemore 5729 (BRH, MO).
Porotrichum cobanense C.Muell.hal. **Cayo**, Mains 3599 (Steere, 1946).
Porotrichum korthalsianum (Dozy & Molk.) Mitt. **Toledo**, Holst 4338 (Holst in Parker et al., 1993); **Cayo**, Allen 15089 (Matola, 1995).
Porotrichum lancifrons (Hampe) Mitt. **Cayo**, Allen 15077; **Toledo**, Allen 15341 (Matola, 1995).
Porotrichum lindigii (Hampe) Britt. **Cayo**, Allen 15146 (Matola, 1995).
Porotrichum longirostre (Hook.) Mitt. **Toledo**, Allen 15495 (Matola, 1995).
Porotrichum mutabile Hampe. **Toledo**, Allen 15486 (Matola, 1995).

- Porotrichum substriatum* (Hampe) Mitt. **Cayo**, Allen 15518B (Matola, 1995).
Porotrichodendron superbum (Tayl.) Broth. **Cayo**, Mains 3750 (Steere, 1946).

DALTONIACEAE

- Daltonia longifolia* Tayl. **Toledo**, Allen 15377 (Matola, 1995).
Leskeodon pusillus (Mitt.) Broth. **Cayo**, Allen 15538; **Toledo**, Allen 15351 (Matola, 1995).

HOOKERIACEAE

- Actinodontium standleyi* Bartr. **Toledo**, Allen 15364C (Matola, 1995).
Callicostella bernoullii (Hampe ex C.Muell.hal.) Broth. **Orange Walk**, Townsend 94/107, 94/118.
Callicostella depressa (Hedw.) Jaeg. **Cayo**, Mains 3977; **Stann Creek**, Gentle 2812c (Steere, 1946); **Toledo**, Allen 18739.
Callicostella grossiretis Bartr. **Cayo**, Allen 18466; **Toledo**, Allen 18715.
Callicostella mexicana Robins. & Welch **Cayo**, Allen 15199 (Matola, 1995).
Callicostella oerstediana (C.Muell.hal.) Jaeg. **Cayo**, Mains 4015 (Steere, 1946).
Callicostella pallida (Hornsch.) Jaeg. **Cayo**, Bartlett 11845 p.p. (Bartram, 1932); **Orange Walk**, Lundell 691b (Steere, 1938); **Toledo**, Allen 15396 (Matola, 1995); **Stann Creek**, Townsend 94/270.
Callicostella rivularis (Mitt.) Jaeg. **Cayo**, Allen 18446, 18865.
Callicostella vatteri Bartr. **Toledo**, Allen 18865A.
Crossomitrium patrisiae (Brid.) C.Muell.hal. **Stann Creek**, Gentle 3498c (Steere, 1946, as *C. herminieri* (Schp.) Jaeg.); **Cayo**, Allen 15514 (Matola, 1995); **Toledo**, Allen 18676, 18722.
Crossomitrium epiphyllum (Mitt.) C.Muell.hal. **Toledo**, Allen 15471 (Matola, 1995); **Stann Creek**, Townsend 94/276, det. Allen.
Cyclodictyon albicans (Hedw.) Broth. **Cayo**, Mains 3654 (Steere, 1946); **Toledo**, Allen 18553, 19980.
Cyclodictyon erubescens Bartr. **Toledo**, Allen 18650.

- Cyclodictyon humectatum* Card. **Cayo**, Allen 18312; **Toledo**, Allen 18577.
Cyclodictyon varians (Sull.) O.Kuntze **Cayo**, Allen 18318; **Toledo**, Allen 18582.
Hookeria acutifolia Hook. & Grev. **Cayo**, Allen 15137 (Matola, 1995).
Hookeriopsis cuspidata Jaeg. **Toledo**, Allen 19054.
Hookeriopsis cruegeriana (C.Muell.hal.) Jaeg. **Toledo**, Allen 18726.
Hookeriopsis dimorpha (C.Muell.hal.) Broth. **Toledo**, Allen 15493 (Matola, 1995).
Hookeriopsis guadalupensis (Spreng. in Brid.) Jaeg. **Cayo**, Allen 15158C; **Toledo**, Allen 15506 (Matola, 1995).
Hookeriopsis guatemalensis Bartr. **Cayo**, Allen 15148; **Toledo**, Allen 18805.
Hookeriopsis incurva (Hornsch.) Broth. **Cayo**, Allen 15515; **Toledo**, Allen 15463 (Matola, 1995).
Hookeriopsis subfalcata (Hampe) Jaeg. **Toledo**, Allen 18781.
Isodrepanium lentulum (Wils.) Britt. **Cayo**, Allen 15123; **Toledo**, Allen 15355 (Matola, 1995).
Lepidopilidium portoricense (C.Muell.hal.) Crum & Steere. **Toledo**, Holst 4335 (Holst in Parker et al., 1993); **Cayo**, Allen 15047, (Matola, 1995).
Lepidopilum brevipes Mitt. **Cayo**, Allen 18371; **Toledo**, Allen 18672.
Lepidopilum cubense (Sull.) Mitt. **Toledo**, Allen 18601.
Lepidopilum polytrichoides (Hedw.) Brid. **Toledo**, Holst 4495 (Holst in Parker et al., 1993); **Cayo**, Allen 18357.
Lepidopilum muelleri (Hampe) Spruce. **Toledo**, Allen 18675.
Lepidopilum scabrisetum (Schwaegr.) Steere **Cayo**, Allen 15160; **Toledo**, Allen 15462B (Matola, 1995).
Lepidopilum surinamense C.Muell.hal. **Toledo**, Allen 18712.
Lepidopilum tortifolium Mitt. **Toledo**, Allen 18896.

PILOTTRICHACEAE

- Pilotrichum evanescens* (C.Muell.hal.) Crosby. **Toledo**, White s.n. (Bartram, 1934, as *P.*

cryphaeoides Besch.); **Cayo**, Mains 3563; **Stann Creek**, Gentle 2157 (Steere, 1946, as *P. amazonum* Mitt.).

Pilotrichum fendleri C.Muell.hal. **Toledo**, Allen 18513.

Pilotrichum ramosissimum Mitt. **Toledo**, Allen 18748B.

LEUCOMIACEAE

Leucomium strumosum (Hornsch.) Mitt. **Cayo**, Mains 3654 (Steere, 1946, as *L. costaricense* Ren. & Card, vide Allen, 1987); **Toledo**, Allen 18532.

Rhynchostegiopsis flexuosa (Sull.) C.Muell.hal. **Cayo**, Allen 15158; **Toledo**, Allen 15479 (Matola, 1995).

Rhynchostegiopsis lutescens Britt. ex Broth. **Toledo**, Allen 15353 (Matola, 1995).

RACOPILACEAE

Racopilum tomentosum (Hedw.) Brid. **Cayo**, Lundell 1977c (Steere, 1934); **Toledo**, Holst 4445 (Holst in Parker et al., 1993).

HYPOPTERYGIACEAE

Hypopterygium tamariscinum (Hedw.) Brid. **Cayo**, Mains 3589 (Steere, 1946, sphalm. *tamarisci*); **Toledo**, Allen 15480 (Matola, 1995).

THUIDIACEAE

Cyrto-hypnum involvens (Hedw.) Buck & Crum **Cayo**, Mains 3810 (Steere, 1946, as *Thuidium involvens* (Hedw.) Mitt.); **Orange Walk**, Townsend 94/105 &c.; **Belize**, Townsend 94/125, 94/132.

Cyrto-hypnum minutulum (Hedw.) Buck & Crum **Cayo**, Allen 18562; **Toledo**, Allen 18629.

Cyrto-hypnum schistocalyx (C.M.) Buck & Crum **Orange Walk**, Lundell 692 (Steere, 1938); **Stann Creek**, Gentle 2140; **Toledo**, Gentle 3886 (Steere, 1946). All as *Thuidium schistocalyx* (C.M.) Mitt.; **Cayo**, Allen 18117.

Thuidium delicatulum (Hedw.) B.S.G. **Cayo**,

Mains 3558; **Stann Creek**, Gentle 2812 (Steere, 1946); **Toledo**, Allen 18571.

Thuidium tomentosum Schimp. ex Besch. **Cayo**, Allen 15155; **Toledo**, Allen 15301B (Matola, 1995).

AMBLYSTEGIACEAE

Leptodictyum riparium (Hedw.) Warnst. **Toledo**, Whittemore 5708 (MO).

BRACHYTHECIACEAE

Aerolindigia capillacea (Hornsch.) Menzel **Toledo**, Allen 18687.

Brachythecium stereopoma (Spruce ex Mitt.) Jaeg. **Cayo**, Allen 18094.

Rhynchostegium semiscabrum (Bartr.) Robins. **Cayo**, Allen 18401.

Stereocleus serrulatus (Hedw.) Robins. **Cayo**, Allen 18132.

MYRINIACEAE

Helicodontium capillare (Hedw.) Jaeg. **Cayo**, Bartlett 13135 (Bartram, 1932) (as *H. tenuirostre* Schwaegr.).

ENTODONTACEAE

Entodon macropodus (Hedw.) C.Muell.hal. **Cayo**, Allen 18056, Townsend 94/217.

Erythrodontium longisetum (Hook.) Par. **Cayo**, Mains 4039 (Steere, 1946).

STEREOPHYLLACEAE

Entodontopsis leucostega (Brid.) Buck & Ireland. **Cayo**, Townsend 94/162.

Eulacophyllum cultelliforme (Sull.) Buck & Ireland. **Cayo**, Allen 18317.

Stereophyllum radiculosum (Hook.) Mitt. **Belize**, Gentle 1002 (Steere, 1938); **Orange Walk**, Townsend 94/149; **Cayo**, Allen 18178, 18188, Townsend, 94/161, 94/181.

SEMATOPHYLLACEAE

Acroporium estrellae (C.Muell.hal.) Buck & Schäfer-Verwimp. **Cayo**, Allen 18006;

- Toledo**, Allen 18653.
- Acroporium longirostre* (Brid.) Buck. **Stann Creek**, Gentle 1937 (Steere, 1946, as *Sematophyllum chrysocladum* (Card.) Broth.); **Cayo**, Allen 15051; **Toledo**, Allen 15363B (Matola, 1995).
- Acroporium pungens* (Hedw.) Broth. **Cayo**, Allen 15147; **Toledo**, Allen 15423 (Matola, 1995).
- Donnellia commutata* (C.Muell.hal.) Broth. **Cayo**, Mains 3982 (Steere, 1946, as *M. tenerum* Mitt.).
- Phyllodon truncatulus* (C.Muell.hal.) Buck **Stann Creek**, Gentle 2812b (Steere, 1946, as *Glossadelphus truncatulus* (C.Muell.hal.) Fleisch.); **Toledo**, Allen 18887.
- Pterogonidium pulchellum* (Hook.) C.Muell.hal. ex Broth. **Stann Creek**, Townsend 94/284.
- Sematophyllum adnatum* (Mich.) Britt. **Belize**, Allen 17995, **Cayo**, Allen 15076 (Matola, 1995); **Toledo**, Allen 19013.
- Sematophyllum cochleatum* (Broth.) Broth. **Cayo**, Allen 18089.
- Sematophyllum cuspidiferum* Mitt. **Cayo**, Allen 18256.
- Sematophyllum galipense* (C.Muell.hal.) Mitt. **Cayo**, Mains 3913 (Steere, 1946); **Belize**, Allen 19092A; **Toledo**, Allen 15337 (Matola, 1995).
- Sematophyllum steyermarkii* Bartr. **Cayo**, Allen 18427.
- Sematophyllum subpinnatum* (Brid.) Britt. **Cayo**, Bartlett 11845, 11846, 11847 (Bartram, 1932, as *S. loxense* (Hook.) Mitt.); **Belize** R., ? **Belize**, Mains 3519 (Steere, 1946, as *S. caespitosum* (Hedw.) Mitt.); **Belize**, Allen 19075, Townsend 94/133; **Toledo**, Allen 15339 (Matola, 1995); **Stann Creek**, Townsend 94/260.
- Sematophyllum subsimplex* (Hedw.) Mitt. **Cayo**., Bartlett 15739 (Bartram, 1932, as *Rhaphidorrhynchium subsimplex* (Hedw.) Broth.); **Belize**, Townsend 94/139; **Stann Creek**, Townsend 94/269; **Toledo**, Allen 18814, 19034.
- Sematophyllum swartzii* (Schwaegr.) Welch & Crum. **Cayo**, Allen 15523; **Toledo**, Allen 15362 (Matola, 1995).
- Taxithelium planum* (Brid.) Mitt. **Cayo**, Bartlett 11739 p.p (Bartram, 1932); **Orange Walk**, Lundell 691; **Stann Creek** and **Toledo** (Steere, 1946, as a note); **Belize**, Allen 18164, 19072, Townsend 94/144.
- Trichosteleum bernoullianum* (C.Muell.hal.) Broth. **Toledo**, Allen 19003B.
- Trichosteleum fluviale* (Mitt.) Jaeg. **Cayo**, Mains 3996; **Toledo**, Gentle 3886 (Steere, 1946).
- Trichosteleum sentosum* (Sull.) Jaeg. **Cayo**, Mains 3675 (Steere, 1946); **Toledo**, Allen 15483B (Matola, 1995).

HYPNACEAE

- Chryso-hypnum diminutivum* (Hampe) Buck. **Cayo**, Bartlett 12252 (Bartram, 1932); **Orange Walk**, Lundell 691a (Steere, 1938). Both as *Microthamnium thelistegium* (C.M.) Mitt.; **Stann Creek**, Gentle 3498d (Steere, 1946, as *Mittenothamnium thelistegium* (C.M.) Card.).
- Ectropothecium leptochaeton* (Schwaegr.) Buck. **Cayo**, Townsend 94/185; **Toledo**, Allen 18696.
- Isopterygium tenerum* (Hedw.) Mitt. **Cayo**, Mains 3698 (Steere, 1946); **Belize**, Townsend 94/138, 94/145; **Stann Creek**, Townsend 94/263, 94/272, 94/278; **Toledo**, Allen 18618.
- Mittenothamnium reptans* (Hedw.) Card. **Cayo**, Mains 3591 (Steere, 1946); **Toledo**, Allen 15481 (Matola, 1995).
- Mittenothamnium salleanum* (Besch.) Card. **Cayo**, Allen 18119; **Toledo**, Allen 18756.
- Mittenothamnium scalpellifolium* (C.Muell.hal.) Crum. **Stann Creek**, Gentle 2812a (Steere, 1946, as *Taxiphyllum scalpellifolium* (C.Muell.hal.) Fleisch.); **Cayo**, Allen 18314, Townsend 94/215.
- Puiggariella aurifolia* (Mitt.) Broth. **Cayo**, Allen 15098; **Toledo**, Allen 15427 (Matola, 1995).
- Taxiphyllum deplanatum* (B. & S. ex Sull.) Fleisch. **Cayo**, Allen 18458.
- Taxiphyllum ligulaefolium* (Bartram) Buck. **Toledo**, Allen 18552.
- Taxiphyllum taxirameum* (Mitt.) Fleisch. **Cayo**, Allen 18465; **Toledo**, Allen 18678.
- Vesicularia vesicularis* (Schwaegr.) Broth. var. *vesicularis*. **Cayo**, Allen 15128; **Tole-**

do, Allen 15309B (Matola, 1995); **Belize**, Allen 19084.
var. *rutilans* (Brid.) Buck **Toledo**, White s.n. (Bartram, 1934); **Cayo**, Mains 3822 (Steere, 1946). Both as *Vesicularia amphibola* (Mitt.) Broth.

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