

## A NEW MOSS CHECKLIST OF NEGARA BRUNEI DARUSSALAM

BENITO C. TAN & HAJI MOHAMED

**Abstract.** A new moss checklist with updated nomenclature is given for the small country of Brunei Darussalam located in the northern part of Borneo. A total of 103 species in 50 genera are now collected and reported. The country's moss flora is still very much undercollected, judging from our present results: (i) the absence of cosmopolitan and common paleotropical species such as *Bryum apiculatum* Schwägr., *Callicostella papillata* (Mont.) Mitt., *Funaria hygrometrica* Hedw., *Isopterygium minutirameum* (Müll. Hal.) A. Jaegr., *Octoblepharum albidum* Hedw. and *Philonotis hastata* (Duby) Wijk & Margad.; (ii) the absence of widespread families such as Pottiaceae and Ditrichaceae; and (iii) the under-representation of speciose genera such as *Ectropothecium*, *Macromitrium*, *Thuidium* and *Trichosteleum*, with only one species collected. The incompleteness of our knowledge of the moss flora makes it impossible to assess the country's endangered moss species.

**Key words:** Borneo, Brunei Darussalam, Kuala Belalong, Mosses

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### INTRODUCTION

The island of Borneo is a paradise of moss diversity. Recently the moss flora of the entire island was estimated to have 721 species in a checklist prepared by Suleiman *et al.* (2006), with the largest component, consisting of 582 species, reported from Sabah State, Malaysia. Yet up to 2009 only 40 species were recorded from Brunei Darussalam, a country located in the central part of the northern half of the island.

### GEOGRAPHICAL LOCATION AND VEGETATION OF BRUNEI DARUSSALAM

The nation of Brunei (*Negara Brunei Darussalam*) is located on the north coast of the island of Borneo. Its northern coastline faces the South China Sea, and the other three sides of its national boundary are surrounded by Sarawak State, Malaysia. Further to the east of the country lies Sabah State, Malaysia, and in the distant south is the Kalimantan part of Indonesia.

The small human population of Brunei,

reported at 401,000 in 2011 (internet information), inhabits a nation with a rich income derived mainly from the oil industry. The country boasts a large expanse of pristine rain forest left relatively untapped and not commercially exploited.

The country has a total area of 5770 square kilometers (Anonymous 2007). The climate type is warm and humid tropical equatorial, with 2800 mm average annual rainfall. Today about 60% of Brunei is still covered with lowland mixed dipterocarp rainforests. Some montane rain forests are scattered along its southern border with Sarawak State. Other types of vegetation found in Brunei include mangrove, peat swamp and heath forest (kerangas).

There are *ca* 6000 species of seed plants known from Brunei (Coode *et al.* 1996; Wong 1997), 99 of which are classified as threatened. The available estimate of the country's fern flora gives 450 species (see 'Brunei's fascinating ferns', *Borneo Bulletin*, June 19, 2000). Information about the local moss flora is meager in comparison.

REVIEW OF BRYOLOGICAL HISTORY  
OF BRUNEI MOSS FLORA

Tan (2000) presented a short history of floristic study of the country's mosses, and prepared and issued the first set of Bruneian moss exsiccata, with 25 numbers belonging to 25 species in 22 genera. Of the 25 moss species represented in the set, 22 were then new records for the country. These newly documented species included several taxa widespread in the Malesian region: *Arthrocormus schimperi*, *Fissidens ceylonensis*, *F. crassinervis*, *Leucobryum javense*, *Leucophanes glaucum*, *Microdus miquelianus* (= *Leptotrichella miqueliana*), *Meiothecium microcarpum* and *Vesicularia miquelii*. This only shows the lamentable state of moss flora collection activity in Brunei.

Fortunately, with the implementation of the new transnational biodiversity project entitled 'Heart of Borneo', undertaken jointly by Malaysia, Indonesia and Brunei Darussalam, the diverse moss flora of Brunei has gained attention of late. The less explored eastern and southeastern parts of the country have been surveyed and extensively collected in recent years. As a result, below we add 24 genera and 63 species of mosses new to the country's flora, increasing the number of indigenous moss taxa to 103 species in 50 genera.

NEW COLLECTION LOCALITY INFORMATION

The new moss species records reported below were made by Prof. Haji Mohamed and his students at the University of Brunei Darussalam from two localities:

1 – Mixed dipterocarp forest in the Kuala Belalong Field Study Centre, mostly on trees, at 100–200 m a.s.l., Temburong District, 5–10 January 2009. Collection numbers shown are preceded by the letter 'B';

2 – Submontane heath forests at 840–1100 m a.s.l. in Temburong District near the Brunei/Sarawak border, collected with Saabiqah Abd. Salam and Liaw Lin-Ji, 3–8 July 2012. Collection numbers shown are without a preceding letter.

We combine below the newly found species records and the already published moss species

from the country into a new checklist with updated nomenclature. Only new collections are provided with collection number(s) and locality and habitat information. The new generic and species records in the moss checklist are asterisked.

With the latest additional collections, the moss flora can now be more clearly seen as an extension of the rich moss flora of Borneo. To date, the country has no endemic moss species within its national boundary. However, it has two of the Bornean endemic mosses: *Sclerohypnum littorale* (Hampe) B. C. Tan and *Octoblepharum arthrocormoides* N. Salazar Allen & B. C. Tan. The Bruneian moss flora is far from being completely surveyed. This is made clear by the absence of a number of cosmopolitan and common paleotropical species such as *Bryum apiculatum* Schwägr., *Callicostella papillata* (Mont.) Mitt., *Funaria hygrometrica* Hedw., *Isopterygium minutirameum* (Müll. Hal.) A. Jaegr., *Octoblepharum albidum* Hedw. and *Philonotis hastata* (Duby) Wijk & Margad., the absence of widespread families of Pottiaceae and Ditrichaceae, and the under-representation of speciose genera with only one species, such as *Ectropothecium*, *Macromitrium*, *Thuidium* and *Trichosteleum*, reported from the country. The incompleteness of our knowledge of the moss flora makes it impossible at present to assess the number of endangered moss species in the country.

MOSES OF BRUNEI

*Acanthorrhynchium* M. Fleisch. (Sematophyllaceae)

*Acanthorrhynchium papillatum* (Harv.) M. Fleisch. (see Suleiman *et al.* 2006) – Kuala Belalong Field Study Centre, 100–200 m, on bamboo, *Haji Mohamed B1024, B1121*.

\**Acroporium* Mitt. (Sematophyllaceae)

\**Acroporium adpersum* (Hampe) Broth. – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1072, B1161*.

\**Acroporium convolutum* (Bosch & Sande Lac.) M. Fleisch. – Temburong District near border of Brunei and Sarawak, 840–1100 m, on tree, *Haji Mohamed et al. 68, 104*.

- \**Acroporium diminutum* (Brid.) M. Fleisch. – Temburong District near border of Brunei and Sarawak, 860 m, on branches, *Haji Mohamed et al.* 9.
- \**Acroporium downii* (Dixon) Broth. – Temburong District near border of Brunei and Sarawak, 860 m, on tree, *Haji Mohamed et al.* 14, 85.
- \**Acroporium johannis-winkleri* Broth. – Temburong District near border of Brunei and Sarawak, 840–1100 m, on tree, *Haji Mohamed et al.* 4, 5, 20, 50, 92.
- \**Acroporium lamprophyllum* Mitt. – Temburong District near border of Brunei and Sarawak, 860 m, on tree and fallen twigs, *Haji Mohamed et al.* 90, 93.
- \**Acroporium rigens* (Dixon) Dixon – Temburong District near border of Brunei and Sarawak, 840–1100 m, on trees, *Haji Mohamed et al.* 10, 23, 67, 88, 91, 105.
- Acroporium rufum* (Reinw. & Hornsch.) M. Fleisch. – Temburong District near border of Brunei and Sarawak, 900 m, on *Agathis* tree, *Haji Mohamed et al.* 121.
- \**Acroporium secundum* (Reinw. & Hornsch.) M. Fleisch. – Temburong District near border of Brunei and Sarawak, 840 m, on log, *Haji Mohamed et al.* 24.
- \**Acroporium stramineum* (Reinw. & Hornsch.) M. Fleisch. – Temburong District near border of Brunei and Sarawak, 840 m, on tree, *Haji Mohamed et al.* 125.
- \**Acroporium strepsiphyllum* (Mont.) B. C. Tan – Temburong District near border of Brunei and Sarawak, 900 m., on tree, *Haji Mohamed et al.* 55.
- \**Aerobryopsis* M. Fleisch. (Metreoriaceae)
- \**Aerobryopsis subleptostigmata* Broth. & Paris. – Kuala Belalong Field Study Centre, 100–200 m, on branches, *Haji Mohamed B1056*.
- Arthrocormus* Dozy & Molk. (Calymperaceae)
- Arthrocormus schimperi* (Dozy & Molk.) Dozy & Molk. (see Suleiman *et al.* 2006).
- \**Callicostella* (Müll. Hal.) Mitt. (Pilotrichaceae)
- \**Callicostella prabaktiana* (Müll. Hal.) Bosch & Sande Lac. – Kuala Belalong Field Study Centre, 100–200 m, on partially submerged logs in stream, colls. *Haji Mohamed B1023, B1122, B1217*.
- Calymperes* Sw. *ex* F. Weber (Calymperaceae)
- \**Calymperes fasciculatum* Dozy & Molk. – Kuala Belalong Field Study Centre, 100–200 m, on rocks along river, *Haji Mohamed B1085, B1214*.
- \**Calymperes lonchophyllum* Schwägr. – Kuala Belalong Field Study Centre, 100–200 m, on base of tree, *Haji Mohamed B1095, B1201, B1209, B1153, B1230*.
- Calymperes moluccense* Schwägr. (see Suleiman *et al.* 2006).
- Calymperes motleyi* Mitt. (see Suleiman *et al.* 2006).
- \**Calymperes palisotti* Schwägr. – Kuala Belalong Field Study Centre, 100–200 m, on base of tree, *Haji Mohamed B1113, B1042*.
- \**Calymperes porrectum* Mitt. – Kuala Belalong Field Study Centre, 100–200 m, on boulder, *Haji Mohamed B1014, B1041* (*pro parte*, on base of tree, mixed with *Mniomalina semilimbata*), *B1214*.
- \**Calymperes strictifolium* (Mitt.) G. Roth – Kuala Belalong Field Study Centre, 100–200 m, on base of tree, coll. *Haji Mohamed B1040*.
- Chaetomitrium* Dozy & Molk. (Symphyodontaceae)
- \**Chaetomitrium borneense* Mitt. – Kuala Belalong Field Study Centre, on twigs, *Haji Mohamed B1203*.
- \**Chaetomitrium orthorrhynchum* (Dozy & Molk.) Bosch & Sande Lac. – Kuala Belalong Field Study Centre, 100–200 m, on twigs, *Haji Mohamed B1021, B1074*.
- Chaetomitrium setosum* Broth. *ex* Dix. (see Suleiman *et al.* 2006).
- \**Cladopodanthus* Dozy & Molk. (Leucobryaceae)
- \**Cladopodanthus speciosus* (Dozy & Molk.) M. Fleisch. – Temburong District near border of Brunei and Sarawak, 890 m, on base of tree, coll. *Haji Mohamed et al.* 63.
- \**Clastobryophilum* M. Fleisch. (Sematophyllaceae)
- \**Clastobryophilum bogoricum* (Bosch & Sande Lac.) M. Fleisch. – Kuala Belalong Field Study Centre, 100–200 m, on fallen leaves and twigs, coll. *Haji Mohamed B1181*.

- \**Clastobryum* Dozy & Molk. (Sematophyllaceae) – Kuala Belalong Field Study Centre, 100–200 m, on tree, coll. *Haji Mohamed B1189*.
- \**Clastobryum cuculligerum* (Sande Lac.) Tixier – Kuala Belalong Field Study Centre, 100–200 m, coll. *Haji Mohamed B1053* (on branch).
- \**Ctenidialphus* M. Flesich. (Hypnaceae)
- \**Ctenidialphus plumularia* (Müll. Hal.) M. Fleisch. – Kuala Belalong Field Study Centre, 100–200 m, on tree, colls. *Haji Mohamed B1087, B1094, B1106, B1011*.
- Dicranoloma* (Renauld) Renauld (Dicranaceae)
- Dicranoloma assimile* (Hampe) Paris (see Suleiman *et al.* 2006).
- \**Dicranoloma blumii* (Nees) Paris – Temburong District near border of Brunei and Sarawak, 840–1100 m, on tree near stream, coll. *Haji Mohamed et al. 27*.
- \**Dicranoloma reflexum* (Müll. Hal.) Renauld – Temburong District near border of Brunei and Sarawak, 860 m, on tree and twigs and exposed soil, *Haji Mohamed et al. 129, 89*.
- Diphyscium* D. Mohr (Diphysciaceae)
- \**Diphyscium mucronifolium* Mitt. – Temburong District near border of Brunei and Sarawak, 840 m, on rock near stream, *Haji Mohamed et al. 87*.
- Diphyscium rupestre* Dozy & Molk. (see Suleiman *et al.* 2006).
- \**Distichophyllum* Dozy & Molk. (Daltoniaceae)
- \**Distichophyllum jungermannoides* (Müll. Hal.) Bosch & Sande Lac. – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1081, B1105* (on tree in Earthwatch plot).
- \**Distichophyllum kinabaluense* Nog. & Z. Iwats. – Temburong District near border of Brunei and Sarawak, about 200 m, on wet soil, *Haji Mohamed et al. 64, 11, 115*.
- Ectropothecium* Mitt. (Hypnaceae)
- Ectropothecium dealbatum* (Reinw. & Hornsch.) Jaeg. (see Suleiman *et al.* 2006)
- \**Ectropothecium monumentorum* (Duby) A. Jaeger – Kuala Belalong Field Study Centre, 100–200 m, on tree, colls. *Haji Mohamed B1072, B1034*.
- \**Ectropothecium ichnotocladum* (Müll. Hal.) A. Jaeger – Kuala Belalong Field Study Centre, 100–200 m, on tree, coll. *Haji Mohamed B1189*.
- \**Exostratum* L. T. Ellis (Calymperaceae)
- \**Exostratum blumii* (Nees ex Hampe) L. T. Ellis – Kuala Belalong Field Study Centre, 100–200 m, on trees, *Haji Mohamed B1067, B1123a, B1231*.
- Fissidens* Hedw. (Fissidentaceae)
- Fissidens ceylonensis* Dozy & Molk. (see Suleiman *et al.* 2006).
- Fissidens crassinervis* Sande Lac. (see Suleiman *et al.* 2006).
- \**Fissidens crispulus* Brid. var. *crispulus* – Kuala Belalong Field Study Centre, 100–200 m, on tree, coll. *Haji Mohamed B1027*.
- \**Fissidens crispulus* Brid. var. *robinsonii* (Broth.) Z. Iwats. & Z.-H. Li – Temburong District near border of Brunei and Sarawak, 840 m, on rock near stream, *Haji Mohamed et al. 87*.
- \**Fissidens hollianus* Dozy & Molk. – Kuala Belalong Field Study Centre, 100–200 m., on tree, *Haji Mohamed B1220*.
- \**Fissidens javanicus* Dozy & Molk. – Kuala Belalong Field Study Centre, 100–200 m, on bank of stream, *Haji Mohamed B1029, B1158 (pro parte), B1047*.
- \**Fissidens nobilis* Griff. – Kuala Belalong Field Study Centre, 100–200 m, on bank of stream, *Haji Mohamed B1158*.
- \**Fissidens zollingeri* Mont. – Kuala Belalong Field Study Centre, 100–200 m, on soil, *Haji Mohamed B1190*.
- \**Garovaglia* Endl. (Pterobryaceae)
- \**Garovaglia compressa* Mitt. – Kuala Belalong Field Study Centre, 100–200 m, on tree sapling, *Haji Mohamed B1022*.
- \**Himantocladium* (Mitt.) M. Flesich. (Neckeraceae)
- \**Himantocladium plumula* (Nees) M. Fleisch. – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1124*.
- \**Hypnodendron* (Müll. Hal.) S. O. Lindberg *ex* Mitt. (Hypnodendraceae)
- \**Hypnodendron spininervium* (Hook.) A. Jaeger & Sauerb. – Kuala Belalong Field Study Centre, 100–200 m,

- on exposed root in moist area, *Haji Mohamed B1231a*.
- \**Hypnodendron dendroides* (Brid.)Touw. – Temburong District near border of Brunei and Sarawak, 860 m, on tree and wet ground, *Haji Mohamed et al. 54*.
- Isocladiella* Dixon (Sematophyllaceae)**
- Isocladiella surcularis* (Dixon) B. C. Tan & Mohamed (see Suleiman *et al.* 2006).
- Leptotrichella* (Müll. Hal.) Lindb. (Dicranaceae)**
- Leptotrichella miqueliana* (Mont.) S. O. Lindberg ex Broth. [syn. *Microdus miquelianus* (Mont.) Besch.] (see Suleiman *et al.* 2006).
- Leucobryum* Hampe (Leucobryaceae)**
- Leucobryum aduncum* (Bosch. & Sande Lac.) M. Fleisch. var. *scalare* (Müll. Hal. ex M. Fleisch.) A. Eddy (see Suleiman *et al.* 2006) – Temburong District near border of Brunei and Sarawak, 840–1100 m, on tree, *Haji Mohamed et al. 78*.
- \**Leucobryum candidum* (Brid. ex P. Beauv.) Wilson – Temburong District near border of Brunei and Sarawak, *Haji Mohamed et al. 77* (no habitat information); Kuala Belalong Field Study Centre, 100–200 m, on log, *Haji Mohamed B1146*.
- \**Leucobryum chlorophyllosum* Müll. Hal. – Temburong District near border of Brunei and Sarawak, 860 m, on tree, *Haji Mohamed et al. 71* (in part), *132*.
- \**Leucobryum javense* (Brid.) Mitt. (see Suleiman *et al.* 2006) – Temburong District near border of Brunei and Sarawak, 860–900m, on humus, *Haji Mohamed et al. 2, 46, 102*.
- \**Leucobryum sanctum* (Brid.) Hampe – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1059*.
- Leucophanes* Brid. (Calymperaceae)**
- Leucophanes glaucum* (Schwägr.) Mitt. (see Suleiman *et al.* 2006)
- Leucophanes candidum* (Schwägr.) Lindb. – Kuala Belalong Field Study Centre, 100–200 m, on log, *Haji Mohamed B1130*.
- \**Leucophanes octoblepharioides* Brid. – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1119*.
- \****Macromitrium* Brid. (Orthotrichaceae)**
- \**Macromitrium ochraceum* (Dozy & Molk.) Müll. Hal. – Temburong District near border of Brunei and Sarawak, on tree, *Haji Mohamed et al. 42, 80, 100, 114, 124*.
- Mastopoma* Cardot (Sematophyllaceae)**
- Mastopoma brauniana* (Sande Lac.) H. Akiyama [syn. *Trismegistia brauniana* (Lac.) M. Flesich.] (see Suleiman *et al.* 2006).
- \**Mastopoma uncinifolium* (Broth.) Broth. – Temburong District near border of Brunei and Sarawak, 1070 m., on tree, *Haji Mohamed et al. 131*.
- Meiothecium* Mitt. (Sematophyllaceae)**
- Meiothecium microcarpum* (Hook.) Mitt. (see Suleiman *et al.* 2006).
- \**Meteorium* (Bridel) Dozy & Molkenboer (Meteoraceae)
- \**Meteorium polytrichum* Dozy & Molk. [syn. *M. miquelianum* (Müll. Hal.) M. Fleisch.] – Temburong District near border of Brunei and Sarawak, 870 m, on tree, *Haji Mohamed et al. 114*.
- Mitthyridium* H. Rob. (Calymperaceae)**
- \**Mitthyridium crassum* (Broth.) H. Rob. – Kuala Belalong Field Study Centre, 100–200 m, on fallen trees, *Haji Mohamed B1037, B1049, B1057*.
- \**Mitthyridium fasciculatum* (Hook. & Grev.) H. Rob. – Kuala Belalong Field Study Centre, 100–200 m, on branch and tree, *Haji Mohamed B1104, B1147*.
- \**Mitthyridium flavum* (Müll. Hal.) H. Rob. – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1001, B1063, B1067, B1099, B1113, B1200*.
- Mitthyridium jungquilianum* (Mitt.) H. Rob. (see Suleiman *et al.* 2006).
- \**Mitthyridium undulatum* (Dozy & Molk.) H. Rob. – Kuala Belalong Field Study Centre, 100–200 m, on trees and branches, *Haji Mohamed B1078, B1108, B1104, B1208*.
- Mitthyridium wallisii* (Muell. Hal.) H. Rob. (see Suleiman *et al.* 2006).

**Mniomalia** Müll. Hal. (Phylloprepaniaceae)

\***Mniomalia semilimbata** (Mitt.) Müll. Hal. (see Suleiman *et al.* 2006) – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1009*.

**Neckeropsis** Reichardt (Neckeraceae)

**Neckeropsis beccariana** (Hampe) A. Touw [syn. *Neckeropsis fleischeri* (Dixon) A. Touw] (Suleiman *et al.* 2006)

\***Neckeropsis gracilentia** (Bosch & Sande Lac.) M. Fleisch. – Kuala Belalong Field Study Centre, 100–200 m, on bark of tree near river, *Haji Mohamed B1123*.

**Octoblepharum** Hedw. (Octoblepharaceae)

**Octoblepharum arthrocormoides** N. Salazar Allen & B. C. Tan (see Salazar Allen & Tan 2010). The type specimen is from the kerangas forest in the Temburong District of Brunei. The species is also found from a limestone area in Sarawak in North Borneo.

**Oedycladium** Mitt. (Myuriaceae)

**Oedycladium pseudorufescens** (Hampe) B. C. Tan & Mohamed [syn. *Piloecium pseudorufescens* (Hampe) Müll. Hal.] (see Suleiman *et al.* 2006).

\***Papillaria** (Müll. Hal.) Lorentz (Family Meteoriaceae)

\***Papillaria fuscescens** (Hook.) A. Jaeger. – Temburong District near border of Brunei and Sarawak, 850 m, on tree, *Haji Mohamed et al.* 66.

\***Papillidiopsis** W. R. Buck & B. C. Tan (Sematophyllaceae)

\***Papillidiopsis malesiana** W. R. Buck & B. C. Tan – Kuala Belalong Field Study Centre, 100–200 m, on tree and branches, *Haji Mohamed B1058, B1038*.

\***Papillidiopsis bruchii** (Dozy & Molk.) W. R. Buck & B. C. Tan – Kuala Belait, Bukit Sawat, UBD plot, on tree, 100 m, *Noramaliyana Haji Manaf 66, 161*.

**Pinnatella** M. Fleisch. (Neckeraceae)

**Pinnatella anacamptolepis** (Müll. Hal.) Broth. (see Suleiman *et al.* 2006)

\***Pinnatella mucronata** (Bosch & Sande Lac.) M. Fleisch. – Kuala Belalong Field Study Centre, 100–

200 m, on tree, *Haji Mohamed B1012, B1084, B1112*.

\***Pogonatum** P. Beauv. (Polytrichaceae)

\***Pogonatum piliferum** (Dozy & Molk.) A. Touw – Temburong District near border of Brunei and Sarawak, 850 m, on dry stream bank, *Haji Mohamed et al. 01, 47, 79*; Kuala Belalong Field Study Centre, 100–200 m, on dry stream bank, *Haji Mohamed B1103*.

\***Pogonatum proliferum** (Griff.) Mitt. – Temburong District near border of Brunei and Sarawak, 850 m, on soil, *Haji Mohamed et al. 51, 103*.

\***Pyrrhobryum** Mitt. (Rhizogoniaceae)

\***Pyrrhobryum latifolium** (Bosch & Sande Lac.) Mitt. – Temburong District near border of Brunei and Sarawak, 829 m, on trunk, *Haji Mohamed et al. 40, 123*.

\***Pyrrhobryum spiniforme** (Hedw.) Mitt. – Temburong District near border of Brunei and Sarawak, 900 m, on tree, *Haji Mohamed et al. 41, 99*.

\***Racopilum** P. Beauv. (Racopilaceae)

\***Racopilum cuspidigerum** (Schwägr.) Lngström – Kuala Belalong Field Study Centre, 100–200 m, on bark of tree, *Haji Mohamed B1090*.

\***Radulina** W. R. Buck & B. C. Tan (Sematophyllaceae)

\***Radulina borbonica** (Bél.) W.R. Buck [syn. *Radulina hamata* (Dozy & Molk.) W. R. Buck & B. C. Tan] – Temburong District near border of Brunei and Sarawak, 840 m, on rocks in river, *Haji Mohamed et al. 52, 119*; Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1052*.

\***Rhizogonium** Brid. (Rhizogoniaceae)

\***Rhizogonium graeffeanum** (Müll. Hal.) A. Jaeger – Temburong District near border of Brunei and Sarawak, 840 m, on tree, *Haji Mohamed et al. 45*.

\***Schistomitrium** Dozy & Molk. (Leucobryaceae)

\***Schistomitrium apiculatum** (Dozy & Molk.) Dozy & Molk. – Temburong District near border of Brunei and Sarawak, 860 m, on tree, *Haji Mohamed et al. 13, 71* (in part), 122.

***Sclerohypnum*** Dixon (Hypnaceae)

***Sclerohypnum littorale*** (Hampe) B. C. Tan (see Suleiman *et al.* 2006)

***Sphagnum*** L. (Sphagnaceae)

***Sphagnum cuspidatum*** Hoffm. (see Suleiman *et al.* 2006)

***Syrrhopodon*** Schwägr. (Calymperaceae)

***Syrrhopodon albovaginatus*** Schwägr. (see Suleiman *et al.* 2006).

***Syrrhopodon aristifolius*** Mitt. (see Suleiman *et al.* 2006).

***Syrrhopodon ciliatus*** (Hook.) Schwägr. (see Suleiman *et al.* 2006).

***Syrrhopodon confertus*** Sande Lac. (see Suleiman *et al.* 2006).

***Syrrhopodon croceus*** Mitt. (see Suleiman *et al.* 2006).

\****Syrrhopodon hispidissimus*** Dixon – Kuala Belalong Field Study Centre, 100–200 m, on tree *Haji Mohamed B1066* (pro parte), *B1210*.

***Syrrhopodon involutus*** Schwägr. (see Suleiman *et al.* 2006).

***Syrrhopodon loreus*** (Lac.) Reese (see Suleiman *et al.* 2006).

***Syrrhopodon muelleri*** (Dozy & Molk.) Sande Lac. (see Suleiman *et al.* 2006).

***Syrrhopodon spiculosus*** Hook. & Grev. (see Suleiman *et al.* 2006).

\****Syrrhopodon tristichus*** Nees ex Schwägr. – Kuala Belalong Field Study Centre, 100–200 m, on trees near river, *Haji Mohamed B1013, B1050, B1051, B1192, B1071* (mixed with *S. loreus*).

***Taxithelium*** Spruce ex Mitt. (Sematophyllaceae)

\****Taxithelium instratum*** (Brid.) Broth. – Kuala Belalong Field Study Centre, 100–200 m, on exposed root stump, *Haji Mohamed B1190, B1198, B1231b*.

\****Taxithelium isocladum*** (Bosch & Sande Lac.) Renaud & Cardot – Temburong District near border of Brunei and Sarawak, 100–200 m, on roots, *Haji Mohamed et al. 1015, 1018*; Kuala Belalong Field Study Centre, 100–200 m, on base of tree, *Haji Mohamed B1066* (pro parte, mixed with *Syrrhopodon hispidissimus*), *B1115*.

***Taxithelium merrillii*** Broth. (see Suleiman *et al.* 2006).

***Thuidium*** Bruch & Schimp. (Thuidiaceae)

\****Thuidium kuripanum*** (Dozy & Molk.) R. Watan. – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1079*.

***Trichosteleum*** Mitt. (Sematophyllaceae)

***Trichosteleum procerum*** Dixon var. *laevifolium* Dixon (see Suleiman *et al.* 2006).

\****Trichosteleum stigosum*** Mitt. [syn. *Trichosteleum singaporense* M. Fleisch.] – Kuala Belalong Field Study Centre, 100–200 m, on tree, *Haji Mohamed B1006a, B1116, B1117*.

***Trimegistia*** (Müll. Hal.) Müll. Hal. (Sematophyllaceae)

\****Trimegistia brachyphylla*** M. Fleisch. – Temburong District near border of Brunei and Sarawak, 860 m, on tree, *Haji Mohamed et al. 51*.

***Trimegistia lancifolia*** (Harv.) Broth. var. *lancifolia* (see Akiyama 2010).

***Trimegistia lancifolia*** (Harv.) Broth. var. *valetonii* (M. Fleisch. ex Dixon) H. Akiyama (see Akiyama 2010).

\****Trimegistia calderensis*** (Sull.) Broth. – Kuala Belait, Bukit Sawat, UBD plot, on tree, 100 m, *Noramaliyana Haji Manaf 199*.

***Vesicularia*** (Müll. Hal.) Müll. Hal. (Hypnaceae)

\****Vesicularia dubyana*** (Müll. Hal.) Broth. – Kuala Belalong Field Study Centre, 100–200 m, on soil, *Haji Mohamed B1068*.

***Vesicularia miquelii*** (Lac.) Fleisch. (see Suleiman *et al.* 2006).

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