

## A preliminary checklist of the bryoflora of the Taita Hills, Kenya

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**Abstract.** A checklist of the bryoflora of the Taita Hills (Kenya) containing 168 taxa in 40 families is presented. Whilst previously only 22 mosses and 39 liverworts were recorded for the area, this study extended our knowledge to 85 and 83 respectively. Twenty taxa are newly recorded for Kenya.

### INTRODUCTION

The Taita Hills are located in south-eastern Kenya about 25 km west of Voi and 150 km inland from the coast, at approximately 3° 20' S and 38° 15' E. They cover an area of about 250 km<sup>2</sup> and rise abruptly from the surrounding Tsavo plains at an altitude of 600-700 m, to a series of ridges with Vuria, the highest point, at 2208 m. The steepness of the rocks is due to the hardness of a quartzite cap overlaying soft metamorphic rocks (Beentje, 1988).

The Taita Hills, together with Mount Sagala and Mount Kasigau, form the northernmost part of the Eastern Arc mountains, and are the sole representatives of this ancient geological formation within the Kenyan political boundaries. This chain of mountains continues south into

Tanzania and includes North and South Pare, East and West Usambara, Nguru, Nguu, Ukaguru, Rubeho, Uluguru, Udzungwa and Mahenge.

The Eastern Arc mountains harbour an unusually high proportion of rare and endemic animals and plants, and together with the coastal forests of Kenya and Tanzania, are recognised as one of the world's 25 biodiversity hot-spots (Myers *et al.*, 2000).

The climate of the Taita Hills is under the influence of the intertropical convergence zone and has a bimodal rainfall pattern, with the long rains occurring between March and May and the short rains between October and December. Mean yearly rainfall is as low as 400-600 mm per annum in the surrounding plains, while Wundanyi, the main town situated at 1460 m, receives about 1330 mm (Krhoda, 1998).

However, the Taita Hills form the first large barrier for moisture-laden clouds which come in from the coast and the precipitation from trapped moisture creates almost permanently humid conditions in the hilltop forests. The southeastern slopes are the most humid, and precipitation in the forests on this side is probably well over 1500 mm, although there are no specific records.

Due to human influence, the remaining indigenous forest in the Taita Hills is highly fragmented into a scatter of patches that ranges in size as follows: Mbololo (168 ha), Ngangao (92 ha), Chawia (50 ha), Fururu (5 ha), Macha (2 ha), Mwachora (2 ha), Ndiwenyi (1 ha), Yale (1 ha), Kichuchenyi (<1 ha) (Beentje, 1988; Bytebier, 2001).

The upland moist or mist forest of the Taita Hills can be classified as *Ocotea* forest (but with *Ocotea* mostly logged out), with *Cola-Craibia* forest in the drier parts of Ngangao and Mbololo, and *Erica-Maesa* forest on Vuria (Beentje, 1990). A more detailed description of the vegetation structure and composition of the remaining indigenous forest fragments can be found in Beentje (1988), Wilder, Brooks and Lens (1998), and Chege and Bytebier (submitted).

## MATERIAL AND METHODS

The following data is compiled from the literature and our own collections, which were made between 1997 and 2000. Where possible, specimens quoted in the literature were mentioned again. Collector names were abbreviated as follows: BB for B. Bytebier, IF for I. Friis and F for R.B. Faden. All other specimens were collected by M. Chuah-Petiot. The collections of the first author are deposited at the East African Herbarium (EA), while those of the second author are deposited at the herbarium of the University of Nairobi (NAI). Names follow O'Shea (1999) for the mosses, and Wigginton (2002) for the liverworts. The sequence of families follows Crosby and Magill (1981) for the mosses and Wigginton and Grolle (1996) for the liverworts. New records for Kenya are marked with \*\*.

## BRYOPSIDA

### FISSIDENTACEAE

***Fissidens asplenioides* Hedw.**

Mbololo (rupicolous): Mb 193b, 1500 m.

***Fissidens bogosicus* Müll.Hal. in Venturi**

Ngangao (rupicolous): Ng 34, 1750 m.

***Fissidens intramarginatus* (Hampe) Mitt.**

Mbololo (terricolous, epiphytic): Mb 66, Mb 80, Mb 158, Mb 177, Mb 205, BB 1305b, BB 1316, BB 1340a, 1600-1650 m; Chawia (terricolous): BB 1493, 1560 m; Macha (terricolous): BB 1466b, 1550 m; Ngangao (terricolous): Ng 47, 1750 m.

***Fissidens megalotis* Schimp. ex Müll.Hal. ssp. *helictocaulos* (Müll.Hal.) Brugg.-Nann.**

Taita Hills, sub *Fissidens pseudorufescens* Müll.Hal. in Kis (1985).

***Fissidens sciophyllus* Mitt.**

Ngangao (terricolous): BB 1369, 1800 m.

***Fissidens submarginatus* Bruch. ex C.Krauss**

Mbololo (terricolous): Mb 205, 1600 m.

**\*\**Fissidens usambaricus* Broth.**

Macha (terricolous): BB 1466a, 1550 m.

**\*\**Fissidens weirii* Mitt.**

Mbololo (epiphytic, terricolous): Mb 149, Mb 177, BB 1305a, 1600-1700 m; Macha (terricolous): BB 1467, 1550 m.

### DITRICHACEAE

***Ditrichium difficile* (Duby) M.Fleisch.**

Mbololo (terricolous): Mb 151, 1650 m.

### DICRANACEAE

***Campylopus dicranoides* Thér.**

Mbololo (terricolous): Mb 147, 1650 m; Ngangao (lignicolous): BB 1123, 1800 m.

**\*\**Campylopus flexuosus* (Hedw.) Brid. var. *incacorrallis* (Herzog) J.-P.Frahm.**

Ngangao (rupicolous): BB 1126, 1800 m.

***Campylopus nivalis* (Brid.) Brid. var. *nivalis***

Vuria (epiphytic): IF 2819, 2200 m, sub *Campylopus stramineus* (Mitt.) A.Jaeger in Bizot *et al.* (1978) and *Campylopus chrismarii* (Müll.Hal.) Mitt. in Kis (1985).

***Campylopus perichaetialis* P.de la Varde & Thér.**

Mbololo (lignicolous): Mb 224, 1650 m.

***Campylopus pilifer* Brid. ssp. *pilifer***

Vuria (epiphytic, lignicolous): BB 1525, BB 1531, 2140 m.

Vuria (terricolous): IF 2828, 2200 m (Kis, 1985), sub *Campylopus introflexus* (Hedw.) Brid. var. *polytrichoides* (De Not.) Giacom in Bizot *et al.* (1978).

***Campylopus savannarum* (Müll.Hal.) Mitt.**

Ngangao (rupicolous): Ng 42, 1750 m.

***Dicranoloma billardieri* (Brid.) Paris**

Vuria (epiphytic): IF 2833, IF 2834, 2200 m (Bizot *et al.*, 1978; Kis, 1985).

***Dicranum johnstonii* Mitt.**

Vuria (epiphytic): BB 1537, 2140 m.

***Leucoloma aspericuspis* P.de la Varde**

Mbololo (epiphytic): Mb 166, Mb 220, 1650 m.

***Pilopogon africanus* Broth. in Mildbr.**

Mbololo (terricolous): Mb 59, 1600 m.

LEUCOBRYACEAE

***Leucobryum isleanum* Besch. var. *molle* (Müll.Hal.) Cardot**

Mbololo (epiphytic, lignicolous): Mb 34, Mb 129, Mb 136, Mb 141, BB 1227, 1550-1650 m; Ngangao (rupicolous, lignicolous): Ng 16; BB 1119, BB 1122, 1800-1850 m.

CALYMPERACEAE

***Syrrhopodon usambaricus* Broth. ex Orbán**

Mbololo (terricolous, lignicolous): Mb 73, Mb 109, Mb 116, BB 1237, BB 1337a, 1600-1650 m.

POTTIACEAE

***Leptodontium longicaule* Mitt. var. *microuncinatum* (Dusén) R.H.Zander**

Wundanyi Hill (Zander, 1972; Kis, 1985).

***Leptodontium viticulosoides* (P.Beauv.) Wijk & Margad. var. *viticulosoides***

Ngangao (epiphytic): Ng 39b, 1750 m; Vuria (lignicolous): BB 1527, 2140 m; Yale (epiphytic): BB 1435, BB 1459, 1830-1880 m.

Vuria (epiphytic, terricolous): IF 2835, 2200 m (Bizot *et al.*, 1978; Kis, 1985).

Wundanyi Hill (Zander, 1972; Kis, 1985).

***Syntrichia fragilis* (Taylor) Ochyra**

Taita Hills, sub *Tortula hildebrandtii* (Müll.Hal.) Broth. in Bizot *et al.* (1978) and *Tortula fragilis* Taylor in Kis (1985).

***Trichostomum brachydontium* Bruch.**

Ngangao (terricolous/lignicolous, rupicolous): Ng 44, BB 1371, 1750-1850 m.

FUNARIACEAE

***Entosthodon hildebrandtii* Müll.Hal.**

Taita Hills (Kis, 1985).

BRYACEAE

***Bryum argenteum* Hedw.**

Macha (terricolous): BB 1473a, 1580 m; Ngangao (rupicolous): BB1380, 1750 m.

***Bryum bulbillicaule* Müll.Hal.**

Taita Hills (Kis, 1985).

***Bryum huillense* Welw. & Duby**

Mbololo (terricolous): Mb 208, 1600 m.

***Bryum keniae* Müll.Hal.**

Mbololo (terricolous): Mb 14, BB 1271, 1550-1600 m; Ngangao (terricolous): BB 1386, BB 1391, 1850 m; Vuria (lignicolous): BB 1522, 2140 m; Yale (terricolous): BB 1448, 1900 m.

***Bryum preussii* Broth.**

Vuria (epiphytic): BB 1674, 2150 m.

***Bryum pseudotriquetrum* (Hedw.) P.Gaertn., B.Mey. & Scherb. var. *pseudotriquetrum***

Macha (rupicolous): BB 1473b, 1580 m; Mwachora (epiphytic): BB 1476, 1600 m; Ngangao (epiphytic): BB 1285, BB 1425, 1750-1780 m; Yale (epiphytic): BB 1462, 1830 m.

***Bryum taitae* Müll.Hal.**

Taita Hills (Kis, 1985).

## RHIZOGONIACEAE

***Pyrrhobryum spiniforme* (Hedw.) Mitt.**

Chawia (lignicolous): BB 1506, 1560 m; Mbololo (lignicolous): Mb 4, Mb 89, Mb 221, BB 1225, BB 1226, BB 1229, 1600 m; Ngangao (lignicolous): BB 1118, 1850 m. Mbololo: F 70/542, 1440-1680 m, sub *Rhizogonium spiniforme* (Hedw.) Bruch in C.Krauss. in Bizot and Pócs (1974) and Kis (1985).

## BARTRAMIACEAE

***Breutelia diffracta* Mitt.**

Vuria (terricolous): BB 1539, 2120 m. Vuria (terricolous, rupicolous): IF 2820, 2200 m (Bizot *et al.*, 1978; Kis, 1985).

***Philonotis curvula* (Müll.Hal.) Kindb.**

Taita Hills (Kis, 1985).

***Philonotis fontana* (Hedw.) Brid.**

Yale (rupicolous): BB1450, 1900 m.

## ORTHOTRICHACEAE

***Macrocoma abyssinica* (Müll.Hal.) Vitt**

Mbololo (epiphytic): Mb 164a, 1600 m.

***Macrocoma tenuis* (Hook. & Grev.) Vitt.**

Mbololo (epiphytic): Mb 164b, BB 1297, BB 1315, 1600-1750 m.

***Macromitrium rufescens* Besch.**

Vuria (epiphytic): IF 2822, IF 2824, 2200 m (Bizot *et al.*, 1978; Kis, 1985).

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

Mbololo (epiphytic): Mb 31, Mb 48, Mb 187, BB 1238, BB 1239, BB 1240, BB 1244, BB 1274, BB 1295, BB 1332, BB 1345, BB 1682, 1550-1750 m; Ngangao (epiphytic, rupicolous): BB 1120, BB 1410, BB 1422, 1780-1920 m.

## RACOPILACEAE

***Racopilum africanum* Mitt**

Chawia (epiphytic, lignicolous): BB 1488, BB 1498, 1560 m; Kichuchenyi (rupicolous): BB 1510, 1460 m; Macha (rupicolous): BB 1463, 1580 m; Mbololo (lignicolous, epiphytic): Mb 143, Mb 216, BB 1270, BB 1356, 1460-1740 m; Mwachora (epiphytic): BB 1475, BB 1477, 1600 m; Ngangao (lignicolous, epiphytic, rupicolous): Ng 3, Ng 36, BB 1360, BB 1365, BB 1428, 1750-1800 m; Yale (rupicolous/lignicolous): BB 1443, 1920 m.

## CRYPHAEACEAE

***Forsstroemia producta* (Hornsch.) Paris**

Mbololo (epiphytic): Mb 210b, 1600 m; Ngangao (epiphytic): BB 1421, 1780 m. Wundanyi (epiphytic): IF 2816, 1400 m (Bizot *et al.*, 1978; Kis, 1985).

***Schoenobryum robustum* (Broth.) Manuel**

Mbololo (epiphytic): Mb 212, 1600 m.

## LEUCODONTACEAE

***Pterogonium gracile* (Hedw.) Sm.**

Ngangao (epiphytic): Ng 28, 1750 m.

## PRIONODONTACEAE

***Prionodon ciliatus* Besch.**

Vuria (epiphytic): BB 1548a, 2100 m.

## RUTENBERGIACEAE

***Neorutenbergia usagarae* (Dixon) Bizot & Pócs**

Mbololo (epiphytic): Mb 64, Mb 127a, Mb 144, BB 1224, BB 1228, BB 1314, BB 1752, 1600-1650 m.

## PTEROBRYACEAE

***Calyptothecium hoehnelii* (Müll.Hal.) Argent**

Ngangao (epiphytic): Ng 11, BB 1375, 1760-1800 m.

***Jaegerina stolonifera* (Müll.Hal.) Müll.Hal. ssp. *stolonifera***

Ngangao (epiphytic): BB 1362, 1800 m.

**\*\**Pterobryon flagelliferum* Mitt.**

Mbololo (epiphytic): Mb 9c, Mb 17, Mb 20, Mb 38, Mb 41a, Mb 72, Mb 94, Mb 95, BB 1298, BB 1309, 1600-1750 m; Ngangao (epiphytic): BB 1714, 1750 m.

**\*\**Renauldia lycopodioides* Bizot ex Pócs**

Chawia (epiphytic): BB 1556a, 1560 m; Mbololo (epiphytic): Mb 8, Mb 9b, Mb 13, Mb 68, Mb 75, Mb 77, Mb 152, Mb 159, Mb 163, BB 1294, BB 1317, 1600 m; Macha (epiphytic): BB 1471, 1550 m; Mwachora (epiphytic): BB 1481, 1620 m.

Ngangao (epiphytic): Ng 14, BB 1283, BB 1284, BB 1420, BB 1715, 1750-1800 m.

## METEORACEAE

***Aerobryidium subpiligerum* (Hampe) Cardot**

Chawia (epiphytic): BB 1502, 1560 m; Mbololo (epiphytic): Mb 82, Mb 137, BB 1319, 1600-1650 m; Ngangao (lignicolous): BB 1378, 1800 m.

Mbololo: F 71/1020/W, 1700-1800 m (Bizot &amp; Pócs, 1982; Kis, 1985).

***Floribundaria floribunda* (Dozy & Molk.) M.Fleisch.**

Chawia (epiphytic): BB 1402, BB 1494, BB 1504, 1560 m; Mbololo (epiphytic): Mb 135, Mb 181, 1650 m.

***Orthostichella pandurifolia* (Müll.Hal.)****W.R.Buck**Syn: *Pilotrichella cuspidata* Broth.

Chawia (epiphytic): BB 1403, BB 1556b, 1560 m; Kichuchenyi (rupicolous): BB 1508, 1460 m; Macha (rupicolous): BB 1464, 1560 m; Mbololo (epiphytic): Mb 25, Mb 219, BB 1312, BB 1341, 1570-1620 m; Mwachora (epiphytic): BB 1478, 1600 m; Ngangao (epiphytic, rupicolous): Ng 10, Ng 39c, BB 1368, 1750-1800 m; Vuria (epiphytic): BB 1541, 2100 m; Yale (epiphytic): BB 1439, BB 1458a, 1830-1880 m.

***Papillaria africana* (Müll.Hal.) A.Jaeger**

Ngangao (epiphytic, rupicolous): Ng 23, BB 1370, BB 1416b, 1700-1800 m; Chawia (epiphytic): BB 1489b, 1560 m; Yale (epiphytic): BB 1452b, BB 1457a, 1458c, BB 1461, 1830-1880 m.

***Pilotrichella ampullacea* (Müll.Hal.)****A.Jaeger**

Mbololo (epiphytic): Mb 120, 1650 m; Yale (epiphytic): BB 1458b, 1830 m.

Vuria (epiphytic): IF 2836, 2200 m (Bizot *et al.*, 1978; Kis, 1985).***Squamidium brasiliense* (Hornsch.) Broth.**

Chawia (epiphytic): BB 1503, 1560 m; Mbololo (epiphytic): Mb 35, Mb 60, Mb 122, Mb 171, BB 1335, BB 1343, BB 1344, 1570-1650 m; Vuria (epiphytic): BB 1532, 2140 m; Yale (epiphytic): BB 1440, BB 1452a, 1880 m.

## NECKERACEAE

***Leptodon smithii* (Hedw.) F.Weber & D.Mohr**Wundanyi (epiphytic): IF 2817, IF 2818, 1400 m (Bizot *et al.*, 1978; Kis, 1985).***Neckera complanata* var. *maxima* Dixon**

Mbololo (epiphytic): Mb 184d, 1650 m.

***Neckera platyantha* (Müll.Hal.) Paris**

Mbololo (epiphytic): Mb 11, Mb 182, BB 1289a, BB 1296a, 1650-1750 m; Ngangao (epiphytic): Ng 6, BB 1373, BB 1374, 1760-1800 m; Yale (epiphytic): BB 1436, BB 1453, 1880 m.

***Porothamnium stipitatum* (Mitt.) Touw ex De Sloover**

Mbololo (epiphytic, lignicolous, rupicolous): Mb 87, Mb 88, Mb 98, Mb 193a, Mb 217, Mb 218, BB 1310, BB 1353, BB 1437, 1460-1880 m; Ngangao (epiphytic/lignicolous): BB 1116, BB 1358, BB 1407, 1760-1850 m; Yale (epiphytic): BB 1437, 1880 m.

***Porotrichum usagarum* Mitt.**

Syn.: *Porotrichum molliculum* Broth.

Mbololo (epiphytic, lignicolous): Mb 93, Mb 215, 1600-1650 m; Ngangao (epiphytic): BB 1361, 1800 m; Vuria (epiphytic): BB 1543, 2100 m.

## HOOKERIAACEAE

***Cyclodictyon borbonicum* (Besch.) Broth.**

Mbololo (epiphytic): BB 1302, 1600-1750 m; Yale (rupicolous): BB 1449, 1900 m.

***Cyclodictyon dixonianum* Demaret**

Mbololo (epiphytic): Mb 3, 1600 m.

**\*\**Cyclodictyon krebjedjense* Broth. in Corb. var. *argutidens* P.de la Varde**

Chawia (lignicolous): BB 1491, 1560 m.

***Cyclodictyon vallis-gratae* (Müll.Hal.)****Kuntze**

Mbololo (epiphytic): Mb 184a, 1650 m.

***Hypopterygium mildbraedii* Broth.**

Mbololo (epiphytic): Mb 46a, Mb 101, BB 1299, BB 1326b, BB 1327b, 1600-1750 m; Ngangao (epiphytic, rupicolous, lignicolous): Ng 13, Ng 15, BB 1115, BB 1381, 1800-1850 m; Chawia (epiphytic): BB 1490, BB 1497, 1560 m.

**\*\**Lopidium pennaeforme* (Brid.) M.Fleisch.**

Mbololo (epiphytic): Mb 46a, Mb 103, Mb 128, Mb 160, Mb 170, Mb 197, BB 1326a, BB 1327a, BB 1331, 1600-1650 m.

## FABRONIACEAE

***Rhizofabronia perpilosa* (Broth.) Broth.**

Yale (epiphytic): BB 1460, 1830 m.

***Rhizofabronia persoonii* (Schwägr.)****M.Fleisch var. *sphaerocarpa* (Dusén) Bizot ex Ochyra**

Vuria (epiphytic): BB 1536, 2150 m.

Vuria: IF 2750, 2200 m (Bizot *et al.*, 1978; Kis, 1985).

## LESKEACEAE

***Lindbergia patentifolia* Dixon**

Chawia (epiphytic): BB 1399, 1560 m.

## THUIDIACEAE

***Thuidium versicolor* (Müll.Hal.) Jaeg.**

Ngangao (rupicolous): Ng 22, 1700 m.

## BRACHYTHECIACEAE

***Palamocladium leskeoides* (Hook.) E. Britton**

Yale (epiphytic): BB 1444, 1920 m.

## ENTODONTACEAE

***Erythrodontium subjulaceum* (Müll.Hal.) Paris**

Vuria (lignicolous): BB 1520, 2150 m.

## PLAGIOTHECIACEAE

***Plagiothecium nitens* Dixon**

Vuria (rupicolous): BB 1547, 2100 m.

## SEMATOPHYLLACEAE

***Macrohymenium acidodon* (Mont.) Dozy & Molk.**

Vuria: IF 2829, 2200 m (Bizot *et al.*, 1978; Kis, 1985).

***Sematophyllum brachycarpum* (Hampe) Broth.**

Mbololo: BB1233, BB1313, 1620-1640 m; Ngangao (lignicolous): BB 1404, 1840 m.

**\*\**Sematophyllum subpinnatum* (Brid.) E.Britton**

Mbololo (lignicolous): BB 1268, 1650 m;  
Ngangao (lignicolous) BB 1416a, 1700 m.

***Wijkia trichocolea* (Müll.Hal.) H.A.Crum**  
Mbololo (lignicolous, epiphytic) : Mb 5, Mb 86,  
Mb 92, Mb 142, 1600-1650 m; Ngangao  
(rupicolous): Ng 7, Ng 26, 1700-1800 m.

## HYPNACEAE

***Hypnum cupressiforme* Hedw.**  
Chawia (epiphytic): BB 1398, BB 1505, 1560  
m; Vuria (lignicolous): BB 1519, BB 1524, 2140  
m.

***Mittenothamnium reptans* (Hedw.) Cardot**  
Vuria (epiphytic): IF 2813, 2200 m sub  
*Mittenothamnium cygnicollum* (Dixon) Wijk &  
Margad. in Bizot *et al.* (1978) and Kis (1985).

## POLYTRICHACEAE

***Atrichum androgynum* (Müll.Hal.) A.Jaeger**  
Mbololo (terricolous): Mb 65, 1600 m.

***Pogonatum urnigerum* (Hedw.) P.Beauv.**  
Mbololo (terricolous): Mb 65, Mb 155, 1600-  
1650 m.

***Polytrichum commune* Hedw.**  
Ngangao (terricolous): BB 1124, 1850 m;  
Vuria (terricolous): BB 1538, 2120 m.

***Polytrichum subpilosum* P.Beauv.**  
Vuria (rupicolous): IF 2831, 2200 m (Bizot *et al.*, 1978; Kis, 1985)  
Vuria (terricolous and rupicolous): IF 2821, IF  
2826, IF 2832, 2200 m, sub *Polytrichum*  
*subformosum* Besch. in Bizot *et al.* (1978) and  
Kis (1985).

## HEPATICOPSIDA

## LEPIDOZIACEAE

***Bazzania decrescens* (Lehm. & Lindenb.)  
Trevis.**  
Mbololo (lignicolous, terricolous, epiphytic): Mb  
28, Mb 185, BB 1230, BB 1231, BB 1234, BB

1235, BB 1236, BB 1241, BB 1243a, BB1308b,  
BB 1322, 1600-1650 m.

**\*\**Bazzania decrescens* (Lehm. & Lindenb.)  
Trevis. ssp. *pumila* (Mitt.) Pócs**  
Mbololo (lignicolous, epiphytic): BB 1222, BB  
1245, BB 1333, 1640 m.

## GEOCALYCEAE

**\*\**Heteroscyphus dubius* (Gottsche) Schiffn.**  
Mbololo (rupicolous, lignicolous): BB 1308a, BB  
1339a, 1570-1620 m; Ngangao (lignicolous): BB  
1406, 1850 m.

**\*\**Leptoscyphus expansus* (Lehm.) Grolle**  
Mbololo (terricolous): Mb 105, 1650 m.

***Leptoscyphus hedbergii* (S.W.Arnell)  
R.M.Schust.**  
Mbololo (rupicolous): BB 1338, BB 1339b, 1570  
m; Kichuchenyi (lignicolous): BB 1511, BB  
1512, 1460 m.

***Lophocolea bidentata* (L.) Dumort.**  
Vuria (epiphytic): IF 2749, 2200 m, sub  
*Lophocolea cuspidata* (Nees) Limpr. in Bizot *et al.* (1978).

***Lophocolea difformis* Nees**  
Mbololo (epiphyllous): F 71/1020/V, 1700-  
1800 m (Bizot and Pócs, 1974).

## PLAGIOCHILACEAE

***Plagiochila barteri* Mitt. ssp. *colorans*  
(Steph.) Pócs**  
Vuria (epiphytic): BB 1530, BB 1533, 2140 m.  
Vuria: IF 2752, 2200 m, sub *Plagiochila colorans*  
Mildbr. in Bizot *et al.* (1978).

***Plagiochila effusa* Steph.**  
Mbololo (epiphytic): Mb 91, BB 1221, 1600-  
1650 m; Ngangao (epiphytic): BB 1711, 1750  
m.

***Plagiochila fusifera* Taylor**  
Mbololo (epiphyllous): F 71/1020/Z, 1700-1800  
m (Bizot and Pócs, 1974).

***Plagiochila integerrima* Steph.**

Mbololo (rupicolous): Mb 193c, BB 1347, 1460-1500 m; Ngangao (rupicolous): BB 1117, 1800 m.

***Plagiochila lastii* Mitt.**

Mbololo (epiphytic): Mb 6, Mb 42, Mb 96, Mb 153, Mb 211, 1600-1750 m; Ngangao (epiphytic): Ng 28, Ng 45, BB 1379, BB 1387, BB 1423, BB 1426, BB 1713, 1750-1850 m; Chawia (epiphytic): BB 1396, BB 1487b, 1550 m.

***Plagiochila pectinata* Willd. ex Lindenb.**

Mbololo (epiphytic): BB 1300, 1600 m.

***Plagiochila pseudoattenuata* S.W. Arnell**

Vuria: IF 2837, 2200 m, sub *Plagiochila* cf. *subalpina* Steph. in Bizot *et al.* (1978).

***Plagiochila squamulosa* Mitt. var. *sinuosa* (Mitt.) Vanden Berghen**

Ngangao (epiphytic): Ng 8, BB 1364, BB 1419, BB 1424, 1700-1800 m; Chawia (epiphytic): BB 1485, BB 1486, BB 1487a, BB 1489c, 1550 m. Vuria (epiphytic): IF 2754, 2200 m, sub *Plagiochila sinuosa* Mitt in Bizot *et al.* (1978).

**\*\**Plagiochila strictifolia* Steph.**

Mbololo (epiphytic): Mb 15, 1600 m.

## RADULACEAE

***Radula ankefinensis* Gottsche ex. Steph.**

Mbololo (epiphytic): Mb 192, Mb 194, 1500 m; Ngangao (epiphytic): Ng 20, BB 1363b, 1800 m.

***Radula boryana* (F. Weber) Mont.**

Mbololo (epiphyte, rupicolous): Mb 10, Mb 26, Mb 27, Mb 61c, Mb 77, Mb 99, Mb 100, Mb 104, Mb 123, BB 1306, BB 1330, BB 1337, BB 1342, BB 1681, BB 1755, 1550-1650 m; Ngangao (rupicolous): Ng 37, 1750 m. Vuria: IF 2755, 2200 m (Bizot *et al.*, 1978).

***Radula evelynae* Yamada**

Ngangao (epiphytic): BB 1363a, 1800 m.

***Radula fulvifolia* (Hook.f. & Tayl.) Gottsche *et al.***

Mbololo (terricolous, epiphytic): Mb 62, Mb 104, Mb 156a, Mb 207, 1600-1650 m; Mwachora (epiphytic): BB 1479, 1600 m; Chawia (epiphytic): BB 1492, 1560 m. Macha (epiphytic): BB 1472, 1550 m.

***Radula madagascariensis* Gottsche**

Mbololo (epiphytic): Mb 47, 1600 m.

***Radula quadrata* Gottsche**

Mbololo (terricolous): Mb 156b, 1650 m; Ngangao (epiphytic): BB 1388, BB 1719b, 1750 m; Yale (epiphytic): BB 1456b, 1830 m.

***Radula stenocalyx* Mont.**

Mbololo (epiphyllous): F 71/1020/U, 1700-1800 m (Bizot and Pócs, 1974).

***Radula voluta* Taylor ex Gottsche *et al.***

Mbololo (epiphytic): BB 1272, 1550 m; Chawia (epiphytic): BB 1507, 1550 m.

## FRULLANIACEAE

***Frullania angulata* Mitt.**

Mbololo (epiphytic): Mb 110, Mb 115, Mb 139, Mb 186, BB 1287, BB 1291, BB 1307, BB 1683, 1600-1750 m; Ngangao (epiphytic): Ng 28, BB 1384, 1750-1850 m; Vuria (epiphytic): BB 1529, BB 1546, 2100-2150 m; Chawia (epiphytic): BB 1397, BB 1400, BB 1401, BB 1484, BB 1489a, BB 1499, BB 1501, 1550-1560 m.

***Frullania apicalis* Mitt.**

Mbololo (epiphytic): Mb 223, 1600 m.

**\*\**Frullania apicalis* Mitt. var. *camerunensis* Vanden Berghen**

Mbololo (epiphytic): Mb 125, 1650 m.

***Frullania arecae* (Spreng.) Gottsche**

Vuria (epiphytic): IF 2747, 2200 m (Bizot *et al.*, 1978).

***Frullania caffraria* Steph.**

Ngangao (epiphytic): BB 1717, 1750 m.



***Frullania ericoides* (Nees) Mont.**

Wundanyi (rupicolous): IF 2760, 1400 m (Bizot *et al.*, 1978).

***Frullania serrata* Gottsche**

Vuria: IF 2753, 2200 m (Bizot *et al.*, 1978).

## LEJEUNEACEAE

***Caudalejeunea hanningtonii* (Mitt.) Schiffn.**

Ngangao (epiphyllous): Ng 41b, 1750 m.

***Cheilolejeunea cordistipula* (Steph.) Grolle ex E.W.Jones**

Mbololo (epiphytic): Mb 126, 1650 m.

***Cheilolejeunea krakakammae* (Lindenb.) R.M.Schust.**

Vuria: IF 2756, 2200 m (Bizot *et al.*, 1978), sub *Strepsilejeunea brevifissa* (Gottsche) Steph. in Bizot *et al.* (1978).

***Cheilolejeunea pocsii* E.W.Jones**

Mbololo (epiphytic): Mb 154, 1650 m.

***Cheilolejeunea surrepens* (Mitt.) E.W.Jones**

Mbololo (epiphyllous): F 71/1020/AB, 1700-1800 m, sub *Cheilolejeunea silvestris* (Gottsche) E.W.Jones var. *silverstris* in (Bizot and Pócs, 1974).

**\*\**Cheilolejeunea usambarana* (Steph.)****Grolle**

Mbololo (epiphytic): Mb 81, 1600 m.

***Cololejeunea africana* (Steph.) R.M.Schust.**

Mbololo (epiphyllous): F 70/761, 1440-1680 m (Bizot and Pócs, 1974).

***Cololejeunea bidentula* (Steph.) E.W.Jones**

Mbololo (epiphyllous): F 71/1020/F, 1700-1800 m (Bizot and Pócs, 1974).

***Cololejeunea cardiocarpa* (Mont.) A.Evans**

Mbololo (epiphyllous): F 70/763, 1440-1680 m (Bizot and Pócs, 1974).

***Cololejeunea cristata* (Steph.) R.M.Schust.**

Mbololo (epiphyllous): BB 1334f, 1640 m.

***Cololejeunea distalopapillata* (E.W.Jones) R.M.Schust.**

Mbololo (epiphyllous): F 70/764, 1440-1680 m (Bizot and Pócs, 1974).

***Cololejeunea duvignaudii* E.W.Jones**

Mbololo (epiphyllous): F 71/1020/D, 1700-1800 m (Bizot and Pócs, 1974).

***Cololejeunea hildebrandii* (Austin) Steph.**

Mbololo (epiphyllous): Mb 108, 1650 m; Ngangao (epiphyllous) Ng 29, Ng 40, 1750 m. Mbololo (epiphyllous): F 70/765, 1440-1680 m, sub *Cololejeunea filicaulis* in Bizot and Pócs (1982).

***Cololejeunea leloutrei* (E.W.Jones) R.M.Schust.**

Mbololo (epiphyllous): Mb 146d, 1650 m. Mbololo (epiphyllous): F 70/767, F 71/1020/A, 1440-1800 m (Bizot and Pócs, 1974).

***Cololejeunea malanjae* Steph.**

Mbololo (epiphyllous): Mb 113e, Mb 146f, BB 1334d, 1640-1650 m.

Mbololo: F 70/766, 1440-1800 m, sub *Cololejeunea grossidens* Steph. in Bizot and Pócs (1974).

**\*\**Cololejeunea tanzaniae* Pócs**

Ngangao (epiphyllous): Ng 41, 1750 m.

***Cololejeunea tonkinensis* Steph.**

Mbololo (epiphyllous): F 70/762, 1440-1680 m, sub *Cololejeunea bolombensis* Steph. Vanden Berghen in Bizot and Pócs (1974).

**\*\**Colura digitalis* (Mitt.) Steph.**

Mbololo (epiphytic and epiphyllous): Mb 1a, Mb 24a, Mb 133a, Mb 138a, Mb 222a, BB 1334a, 1600-1650 m.

**\*\**Colura usambarica* E.W.Jones**

Mbololo (epiphytic and epiphyllous): Mb 1b, Mb 24b, Mb 133b, Mb 138b, Mb 222b, BB 1334g, 1600-1650 m.

***Diplasiolejeunea albifolia* (Taylor) E.W.Jones**

Mbololo (epiphyllous): Mb 113a, Mb 146c, BB 1334i, 1650 m.

Mbololo (epiphyllous): F 70/768, F 71/1020/B, 1440-1800 m (Bizot and Pócs, 1974).

***Displasiolejeunea runssorensis* Steph.**

Mbololo (epiphyllous): F 71/1020/AA, 1700-1800 m (Bizot and Pócs, 1974).

***Diplasiolejeunea zakiae* Tixier**

Mbololo (epiphyllous): Mb 108a, Mb 113b, Mb 146a, 1650 m; Ngangao (epiphyllous): Ng 41a, 1750 m.

Mbololo (epiphyllous): F 70/769, F 71/1020/G, 1440-1800 m, but misidentified as *Displasiolejeunea utriculata* Steph. in Bizot and Pócs (1974) (Bizot and Pócs, 1982)

Mbololo: F 71/968/X, 1450-1800 m (Bizot and Pócs, 1982).

***Drepanolejeunea cultrella* (Mitt.) Steph.**

Mbololo (epiphyllous): Mb 113d, BB 1334e, 1640-1650 m.

Mbololo (epiphyllous): F 70/759, F 71/1020/F, 1440-1800 m (Bizot and Pócs, 1974); Mbololo: F 71/968/D, J, M, Q, T, 1450-1600 m (Bizot and Pócs, 1982).

***Drepanolejeunea madagascariensis* (Steph.) Grolle**

Mbololo (epiphyllous): Mb 113c, Mb 146g, BB 1334c, 1640-1650 m.

***Drepanolejeunea physaefolia* (Gottsche) Steph.**

Mbololo (epiphyllous): F 71/1020/Y, 1700-1800 m, sub *Drepanolejeunea friesii* Vanden Berghen (Bizot and Pócs, 1974).

***Drepanolejeunea pocsii* Grolle**

Mbololo (epiphyllous): Mb 113f, Mb 146e, BB 1320, BB 1334b, 1600-1650 m.

***Drepanolejeunea trematodes* (Nees) Bischl.**

Mbololo (epiphyllous): Mb 146b, 1650 m.

***Lejeunea acuta* Mitt.**

Mbololo (epiphyllous): Mb 22, 1600 m.

***Lejeunea caespitosa* Lindenb.**

Chawia (epiphytic): BB 1500, 1560 m.

***Lejeunea flava* (Sw.) Nees**

Ngangao (epiphyllous): Ng 41, 1750 m.

***Lejeunea hepaticola* (Steph.) Steph.**

Mbololo (epiphytic): Mb 29, Mb 44, Mb 62, BB 1328, 1600-1640 m; Ngangao (epiphytic): BB 1390, 1900 m; Vuria (lignicolous): BB 1521, 2140 m.

***Lejeunea isophylla* E.W.Jones**

Vuria: IF 2748, 2200 m (Bizot *et al.*, 1978).

***Lejeunea tabularis* (Spreng.) Gottsche *et al.***

Mbololo (epiphyllous): F 71/1020/R, 1700-1800 m, sub *Lejeunea flava* Sw. ssp. *tabularis* (Spreng.) S.W.Arnell in Bizot and Pócs (1974).

***Leptolejeunea maculata* (Mitt.) Schiffn.**

Mbololo (epiphyllous): F 71/1020/J, 1700-1800 m, sub *Leptolejeunea thomeensis* (Steph.) Steph. in Bizot and Pócs (1974).

**\*\**Leucolejeunea uncioba* (Lindenb.) A.Evans**

Mbololo (epiphytic): Mb 44, Mb 153, 1600-1650 m.

***Leucolejeunea xanthocarpa* (Lehm. & Lindenb.) A.Evans**

Ngangao (epiphytic): BB 1382, BB 1719a, 1750-1860 m; Yale (epiphytic): BB 1456a, 1830 m; Vuria (epiphytic): BB 1540a, 2200 m. Vuria: IF 2759, 2200 m (Bizot *et al.*, 1978).

***Marchesinia excavata* (Mitt.) Schiffn.**

Vuria: IF 2757a, 2200 m (Bizot *et al.*, 1978).

***Marchesinia madagassa* Steph.**

Mbololo (epiphytic): Mb 168, 1600 m.

***Microlejeunea africana* Steph.**

Mbololo (epiphytic): Mb 30, Mb 213, BB1334j, 1600 m.

Mbololo (epiphyllous): F 70/770, F 71/1020/E, 1440-1800 m (Bizot and Pócs, 1974).

***Odontolejeunea lunulata* (F.Weber) Schiffn.**

Chawia (epiphyllous): BB 1664, 1550 m; Mbololo (epiphyllous): BB 1334f, 1640 m; Ngangao (epiphyllous): BB 1671, 1800 m. Mbololo (epiphyllous): F 70/771, F 71/1020/H,

1440-1800 m, sub *Odontolejeunea tortuosa* (Lehm. & Lindenb.) Steph. in Bizot and Pócs (1974).

***Ptychanthus striatus* (Lehm. & Lindenb.) Nees**  
Mbololo (epiphytic): Mb 85, Mb 161, Mb 180, BB 1293a, BB 1318, 1600-1750 m; Ngangao (epiphytic): Ng 38, 1750 m.

***Schiffneriolejeunea pappeana* (Nees) Gradst.**  
Mbololo (epiphytic): Mb 29, 1600 m.

***Taxilejeunea conformis* (Mont. & Nees) Steph.**  
Vuria: IF 2818a, 2200 m (Bizot *et al.*, 1978).

#### METZGERIACEAE

**\*\**Metzgeria attenuata* Steph.**  
Mbololo (epiphytic): Mb 183, 1650 m.

***Metzgeria australis* Steph.**  
Mbololo (epiphyllous): F 71/1020/Q, 1700-1800 m, sub *Metzgeria madagassa* Steph. in Bizot and Pócs (1974).

**\*\**Metzgeria decipiens* (C.Massal.) Schiffn.**  
Mbololo (epiphytic): BB 1292, BB 1301, 1600-1750 m.

***Metzgeria limbato-setosa* Steph.**  
Vuria (epiphytic): BB 1542, 2100 m.  
Vuria (epiphytic): IF 2757, 2200 m (Bizot *et al.*, 1978).

#### WIESNERELLACEAE

***Dumortiera hirsuta* (Sw.) Nees**  
Mbololo (terricolous/rupicolous): Mb 202, BB 1346, 1450-1500 m.  
Wundanyi Road (terricolous): IF 2745, ±1400 m (Bizot *et al.*, 1978). The altitude in this paper is given as 2000 m, but this is certainly erroneous, as the only areas reaching 2000 m are Vuria and Yale.

#### AYTONIACEAE

***Plagiochasma eximium* (Schiffn. in Steph.) Steph.**  
Ngangao (rupicolous): BB 1427, 1780 m.

***Plagiochasma rupestre* (J.R.Forst. & G.Forst.) Steph.**  
Ngangao (rupicolous): Ng 33, 1750 m.

#### MARCHANTIACEAE

***Marchantia pappeana* Lehm.**  
Mwatate River (terricolous): IF 2761, 1300 m, sub *Marchantia wilmsii* Steph. in Bizot *et al.* (1978).

#### RICCIACEAE

***Riccia stricta* (Lindenb.) Perold**  
Ngangao (aquatic): BB 1418, 1650 m.

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