

## EAST AFRICAN BRYOPHYTES I.

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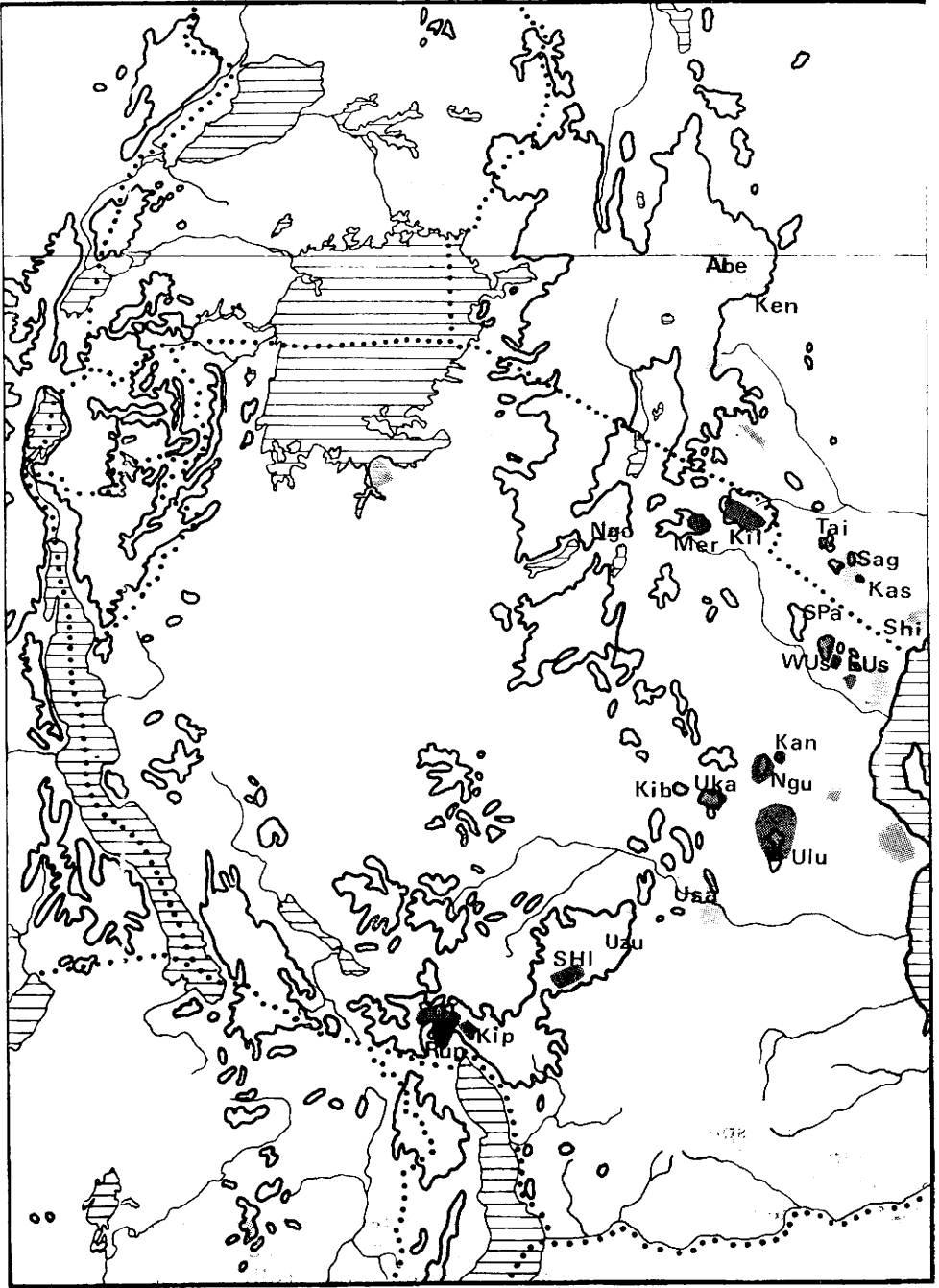
### S u m m a r y

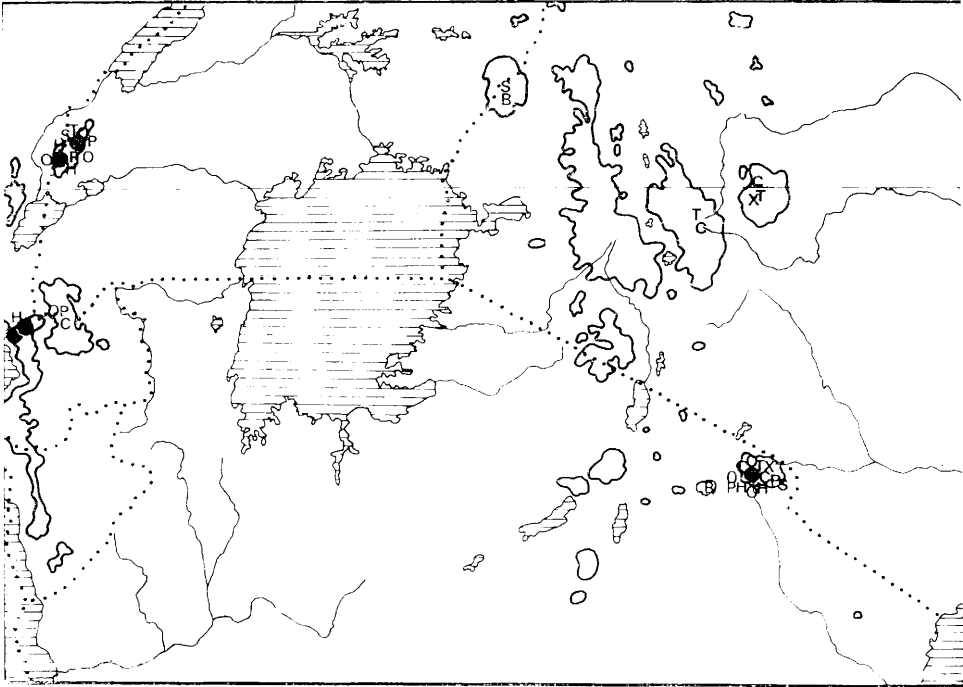
441 species of bryophytes are reported from East Africa, based on the collections made by T. Pócs, E. W. Jones, R. B. Faden and others. 115 of them are new for East Africa. Among them 4 are new for the whole tropical Africa, as *Kurzia verrucosa*, *Tritomaria exsecta*, *Leptolejeunea epiphylla* and *Isopterygium seligeri* = *Dolichotheca silesiaca*; 30 are new for continental Africa, previously known only from Madagascar and from the Mascarene Islands, as *Bazzania borbonica*, *Chiloscyphus mascarenensis*, *Leucophanes rodriguezii*, *Macrohymenium acicodon*, and others. 16 afro-alpine elements (partly endemic, partly circumboreal) are new for Kilimanjaro Mts., like *Chandonanthus cavallii*, *Gymnomitrium laceratum*, *Plagiochila ericicola*, *Tetraplodon mnioides*, etc. Such elements are also reported from Uluguru Mts. (10, as *Campylopus alpicolus*, *Leucoloma volkensii*) and from the Poroto and Rungwe Mts. in Southern Tanzania (8 species, and *Campylopus procerus*, *Entodon vulcanicus*, and others). The taxonomic position of *Spoggodera cavallii* = *Oligotrichum cavallii* is clarified. *Leskeodon mniifolium* (Hornsch.) Bizot as new combination is published. New synonyms are given for *Ptychanthus striatus*, *Leptolejeunea epiphylla*, *Groutiella tomentosa*, *Squamidium biforme*, *Catagonium nitens*, *Eriopus asplenoides*, *Leskeodon mniifolium* and for *Regmatodon secundus*. *Neorutenbergia armata* is synonymized with *Rutenbergia usagarae* and a new combination is created: *Neorutenbergia usagarae*. The generic name *Jonesiobryum* is proposed instead of *Jonesia Bizot et Pócs*.

### P r e f a c e

T. Pócs spent four years in Morogoro, Tanzania, as a senior lecturer in Botany, at the Faculty of Agriculture of the University of Dar es Salaam. This paper enumerates the first records of his bryophyte collections, together with other collectors' material. (See the sites on Map. 1.)

T. Pócs wishes to express his gratitude towards the University of Dar es Salaam, which sponsored his research and collecting activity. For submitting their material for elaboration the authors are indebted to





Map 2. Endemic and circumboreal afroalpine elements. Distribution of *Chandonanthus hirtellus* ssp. *giganteus* Steph. (shaded); *Plagiochila ericicola* Steph. (P); *Chiloscyphus muhavurensis* S. Arnell (C); *Bryum leptoneurum* P. de la Varde + *B. brevinerve* Dix. (B); *Hygrohypnum hedbergii* P. de la Varde (X); *Sematophyllum elgonense* (Dix.) Broth. (S); *Oligotrichum cavallii* (Negri) G. L. Smith (O). Tropical African distribution of *Chandonanthus cavallii* (Gola) S. Arnell (full circle); *Tetraplodon mnioides* (Hedw.) B. S. G. (T) and of *Hylocomium splendens* (Hedw.) B. S. G. (H). Contours at 2100 m alt.

R. B. Faden (St. Louis), D. J. Mabberley (Oxford), L. Ryvarden (Oslo), A. D. Q. Agnew (Nairobi) through J. Vána (Praha), Ch. Paget—Wilkes (Mufindi).

Most of the *Musci* were identified by M. Bizot and the greater part of *Hepaticae* by T. Pócs. He is very thankful for the identification of critical genera and for revisions to R. Grolle (Jena), E. W. Jones (Oxford), J. Vána (Praha) and to C. Vanden—Berghen (Bruxelles).

For the availability of comparative materials the authors express their thanks to the directors and curators of the Herbaria in British Mu-

Map 1. The collecting sites. Contours at 1500 m altitude.  
1: Areas, where large scale collections were made.  
2: Areas less intensively studied.  
The abbreviations used are explained on page 397.

seum, Natural History (BM), Natural History Museums in Paris (PC) and Budapest (BP), to the Conservatoire et Jardin Botaniques, Geneva (G), to the Palaeobotanical Department of the Swedish Museum of Natural History (S—PA) and to the East African Herbarium in Nairobi (EA). The listed specimens are deposited mostly in the Herbaria of the Teachers College, Eger (EGR), of the University of Dijon, University of Dar es Salaam and in the Herbaria of EA and BP.

### The distribution of the species listed

The distribution pattern of each species was analysed and on this base the species may be classified in the following types:

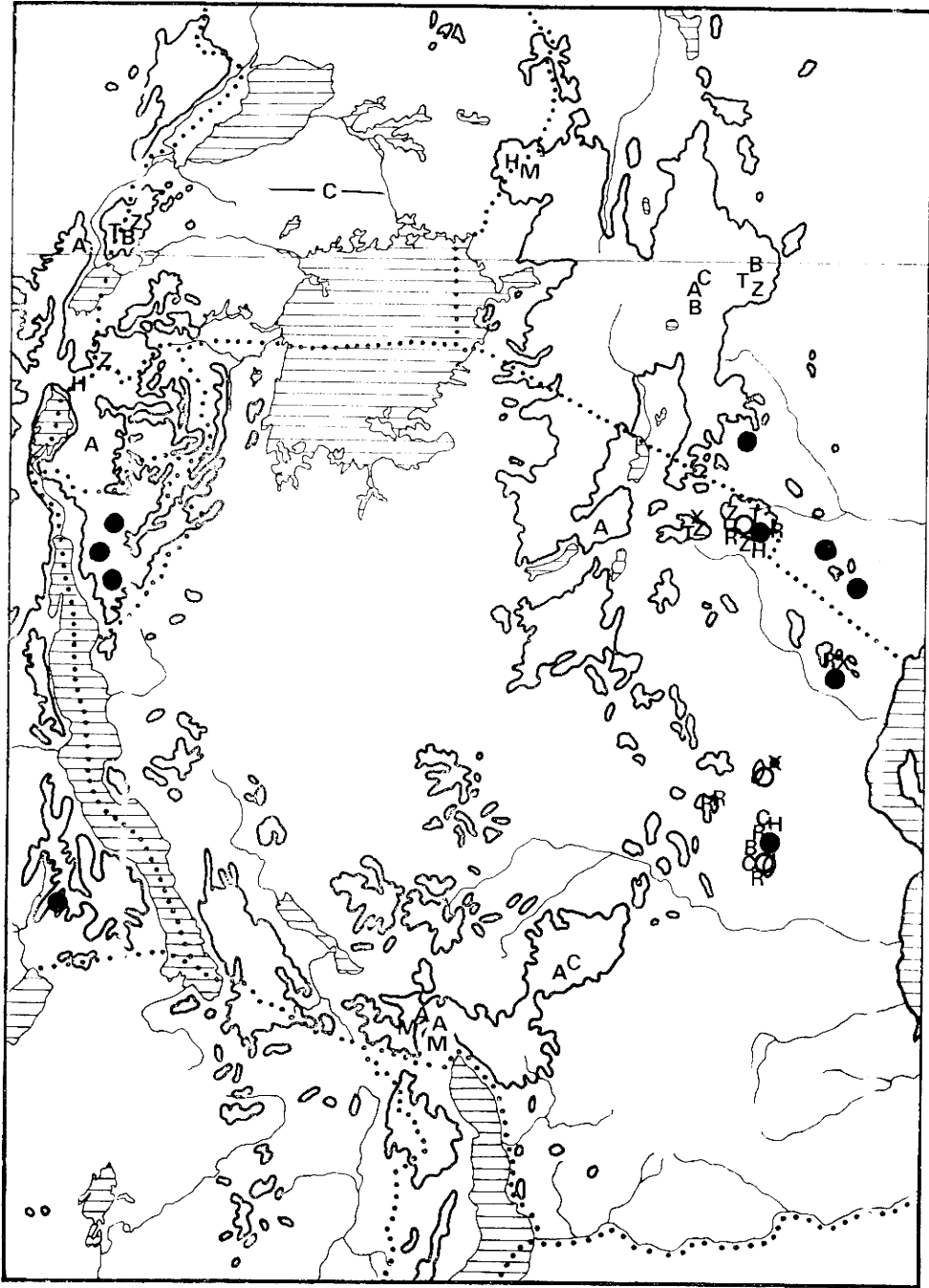
**Afroalpine elements.** (Map 2.) The endemic species of the East African high mountains occurring near or above the timberline, usually above 2500m altitude: *Bazzania laxifolia*, *Chandonanthus cavallii*, *Chandonanthus hirtellus* ssp. *giganteus*, *Chiloscyphus muhavurensis*, *Jungermannia abyssinica* (in Ethiopia too), *Diplophyllum africanum*, *Plagiochila ericicola*, *Metzgeria hedbergii*, *Campylopus alpicolus* (in Ethiopia too) *Campylopus procerus*, *Tortula cavallii*, *Anoetangium eukilimandscharicum*, *Bryum leptoneuron*, *B. ellipsifolium*, *B. perspinidens?*, *Neckera platyantha*, *N. submacrocarpa*, *Hygrohypnum hedbergii*, *Brachythecium duemmeri*, *Br. spectabile*, *Sematophyllum elgonense*, *Breutelia stuhlmannii*, *Oligotrichum cavallii*; common with Cameroon Mts.: *Gongylanthus richardsii*, *Campylopus stramineus*, *Leptodontium tenerascens*, *Rhacomitrium alare*; common with South African high mountains: *Anastrophyllum gambaragarae*, *Plagiochila subalpina*, *Campylopus symoensii*.

**Circumboreal elements** with afroalpine or afroalpine disjunction (Map 2): *Blepharostoma trichophyllum*, *Tritomaria exsecta*, *Jungermannia sphaerocarpa*, *Hymenostylium scabrum*, *Tetraplodon mnioides* (+ New Guinea), *Anomobryum filiforme* (+ South America), *Philonotis tomentella*, *Antitrichia curtispindula*, *Thuidium tamariscinum*, *Isopterygium seligeri* (= *Dolichotheca silesiaca*), *Drepanocladus uncinatus* (+ Australia, Antartics), *Hylocomium splendens* (+ Antilles, New Zealand). Most of them are altimontane in East Africa, above 2500 m altitude.

**East African montane elements** (Map 3.) Endemics, or with a disjunction in Ethiopia — **E**; or Southwards, as in Malawi, Zambia or Rhodesia — **S**: *Marchesia moelleriana* — **S**, *Plagiochila divergens* var. *myriocar-*

Map 3. The distribution of East African montane elements.

*Cololejeunea distalopapillata* E. W. Jones (full circle); *Leucoloma volkensis* Broth. (open circle); *Zygodon seriatum* Thér. et Nav. (**Z**) + Ethiopia; *Acrocryphaea robusta* Broth. (**A**); *Thuidium loricaleycinum* (C. Muell.) Kindb. (**T**); *Orthostichopsis pinnatella* (Broth.) Broth. (**X**); *Rigodium kilimandscharicum* (Broth.) Par. (**R**) + Mulanje Mts.; *Hypopterygium mildbraedii* Broth. (**H**); *Cyatophorella africana* (Dix.) Broth. (**C**) + Ethiopia; *Mittenothamnium brevicuspis* P. de la Varde (**M**). Contours at 1500 m altitude.



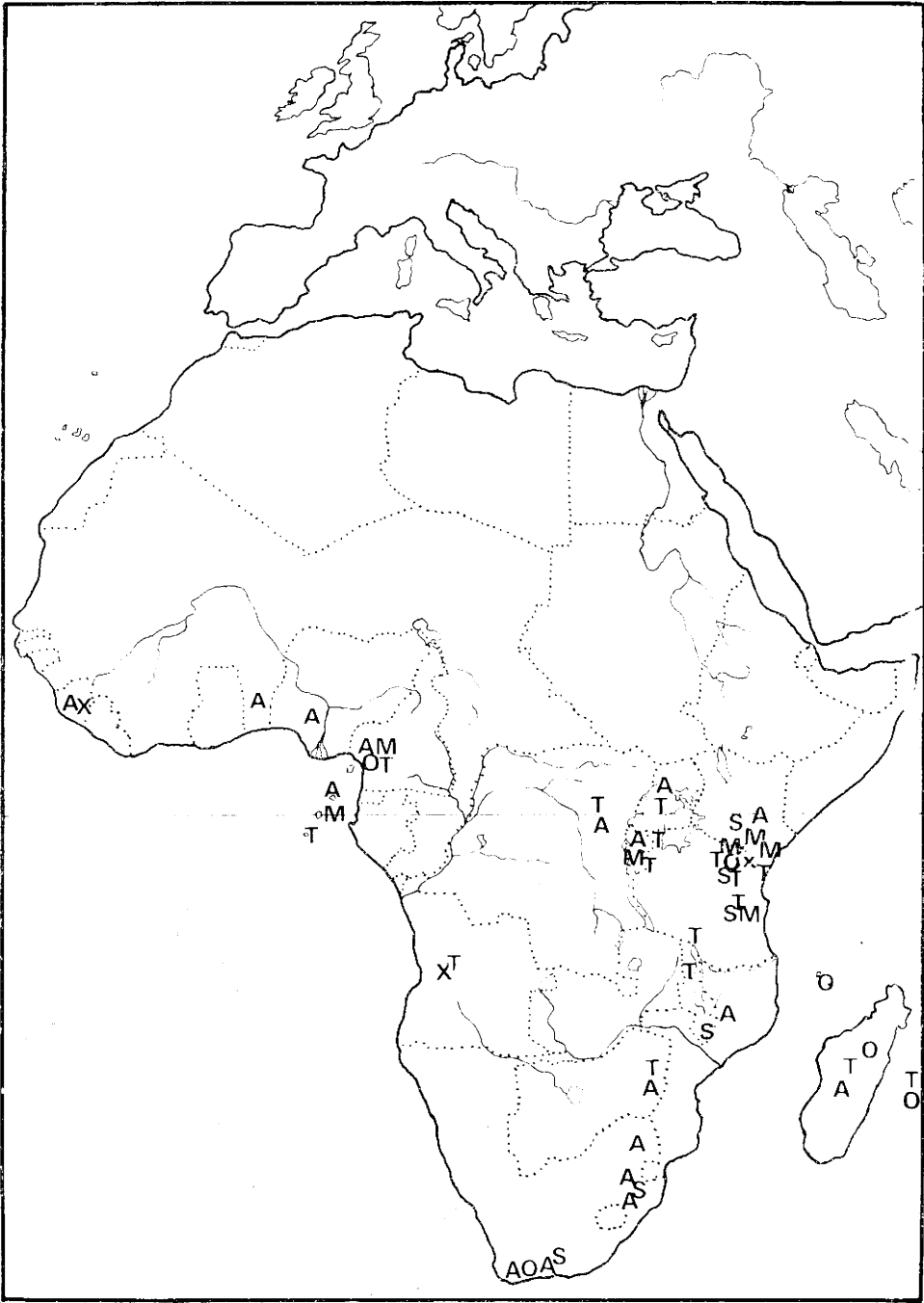
pa, *Plagiochila sinuosa*, *Schistochila engleriana*, *Cololejeunea distalopapillata*, *C. grossidentata* — S, *C. punctata*, *Drepanolejeunea friesii*, *Diplasiolejeunea symoensii*, *Lopholejeunea kilimanjarica*, *L. laciniata*, *Riccardia holstii*, *Metzgeria propagulifera*, *C. schröderi*, *Dicranum johnstonii*, *Leucoloma aspericuspis*, *L. bifidum* var. *tanganikae*, *L. volkensis*, *Syrrhopodon stuhlmanii*. *Calymperes usambaricus*, *Leptodontium volkensis*, *Hyophila holstii*, *Pohlia cratericola*, *Brachymenium holstii*, *Rhodobryum keniae*, *Rh. spathulosifolium*, *Philonotis maranguensis*, *Ph. ruwensorensis*, *Ph. schroederi*, *Zygodon seriatus*, *Macromitrium abyssinicum* — E, *M. protractum*, *Sclotheimia rigescens*, *Rhacopilum macrocarpum*, *Braunia camptoclada*, *Acrocryphaea robusta*, *Leucodon dracaenae* — E, *Leucodon laxifolius* — E, *Trachypodopsis laxo-alaris*, *Jaegerina stolonifera* spp. *laticuspis*, *Orthostichopsis pinnatella*, *Pterobryon flagelliferum*, *Squamidium densirameum*, *Pilotrichella ampullacea* (+ Comores), *P. cuspidata*, *P. holstii*, *P. pilifolia*, *Pinnatella oblongifrondea*, *Porotrichum ruficaule*, *P. subpennaeforme*, *Rigodium kilimandscharicum* — S, *Distichophyllidium africanum* (Asian genus), *Cyclodiction brevifolium*, *Callicostella usambarica*, *Lepidopilidium hanningtonii*, *Lepidopilum lastii*, *Hypopterygium mildbraedii*, *Cyatophorella africana* — E (Asian genus), *Fabronia leikipiae* — E, S, F *longipila*, *Thuidium loricalycinum*, *Rhynchostegium volkensis*, *Rhynchostegiella holstii*, *Entodon vulcanicus*, *Plagiothecium nitens*, *Mittenothamnium overlattii*, *M. stuhlmannii*, *M. brevicuspis*, *Pogonatum usambaricum*. These species occur mostly in the montane forest belt.

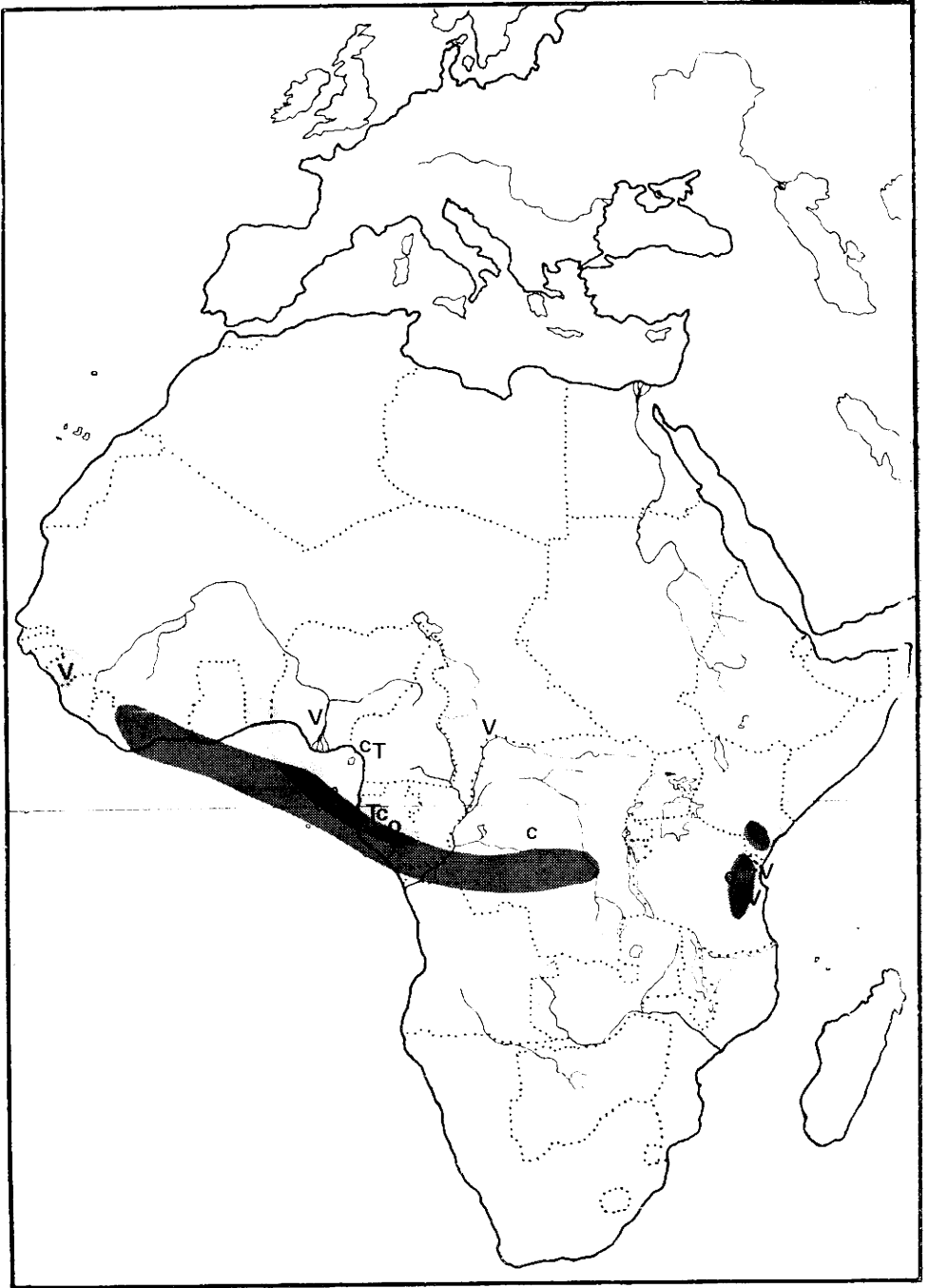
Species common to the **East African mountains and South Africa**: *Lophocolea difformis*, *Jungermannia borgenii*. *Lethocolea congesta*, *Gongylanthus renifolius*, *Radula capensis*, *R. meyeri*, *Porella capensis*, *P. hoehnelii*, *Frullania borgenii*, *F. caffraria*, *F. diptera*, *F. rehmanii*, *F. trinervis*, *Lejeunea arnelliana*, *Metzgeria limbato-setosa*, *M. tabularis*, *Symphogyna harveyana*, *Trematodon divaricatus*, *Dicranella borgeniana*, *D. subulata*, *Campylopus chlorotrichus*, *Hydrogonium afrofontanum*, *Physcomitrellopsis africana*, *Funaria marginata*, *Pohlia philonotula*, *Rhodobryum umbraculum*, *Breutelia aristaria*, *Zygodon trichomitrius*, *Schlotheimia percuspidata*, *Calypsothecium hoehnelii*, *Hookeriopsis pappeana*, *Lopidium pennaeforme*, *Thuidium sublaevipes*, *T. versicolor*, *Palamocladium sericeum*, *Brachythecium implicatum*, *B. stricto-patens*, *Mittenothamnium cygnicollum*, *M. pseudoreptans*, *Pogonatum simense* — to Ethiopia.

**Afromontane elements**, common to East and West African mountains (Map 4.): *Lophocolea lucida*, *Chiloscyphus dubius*, *Leptoscyphus infuscatus*, *Plagiochila effusa*, *Plagiochila terebrans*, *Radula recurvifolia*, *R. stipatiflora*, *Porella abyssinica*, *P. subdentata*, *Frullania angulata*, *Frullania truncatiloba*, *Cololejeunea dentata*, *C. elegans*, *C. filicaulis*, *C. zenkerii*, *Ptychocoleus molleri*, *Brachiolejeunea tristis*, *Microlejeunea kamerunen-*

Map 4. Distribution of afromontane species.

*Plagiochila effusa* Steph. (X); *P. terebrans* Lindenb. ex Nees et Mont. (T); *P. subalpina* Steph. (S); *Lophocolea lucida* (Spreng. ex Lehm.) Mont. (O); *Microlejeunea kamerunensis* Steph. (M); *M. africana* Steph. (A).







*sis*, *Drepanolejeunea friesii*, *Lejeunea acuta*, *L. longirostris*, *Metzgeria thomeensis*, *Asterella abyssinica* — *E. A. linearis*, *Marchantia parviloba*, *Syrrhopodon mildbraedii*, *Bartramia jungneri*, *Breutelia subgnaphalea*, *Braunia arbuscula*, *Neckera remota* (+ Middle East), *Pinnatella tamariscina*, *Porotrichum ramulosum*, *Daltonia patula*, *Hookeriopsis mittenii*, *Lepidopilidium devexum*, *Lepidopilum dusenii* (+Eur.?), *Fabronia congolensis*, *Rhizofabronia persoonii* with var. *sphaerocarpa*, *Rh. perpilosa*, *Pseudoleskea dispersa*, *Rhynchostegium bello-intricatum*, *Acanthocladium cuynetii*, *A. trichocoleoides*, *Sematophyllum elgonense*, *S. laetevirens*, *Trichosteleum humbertii*.

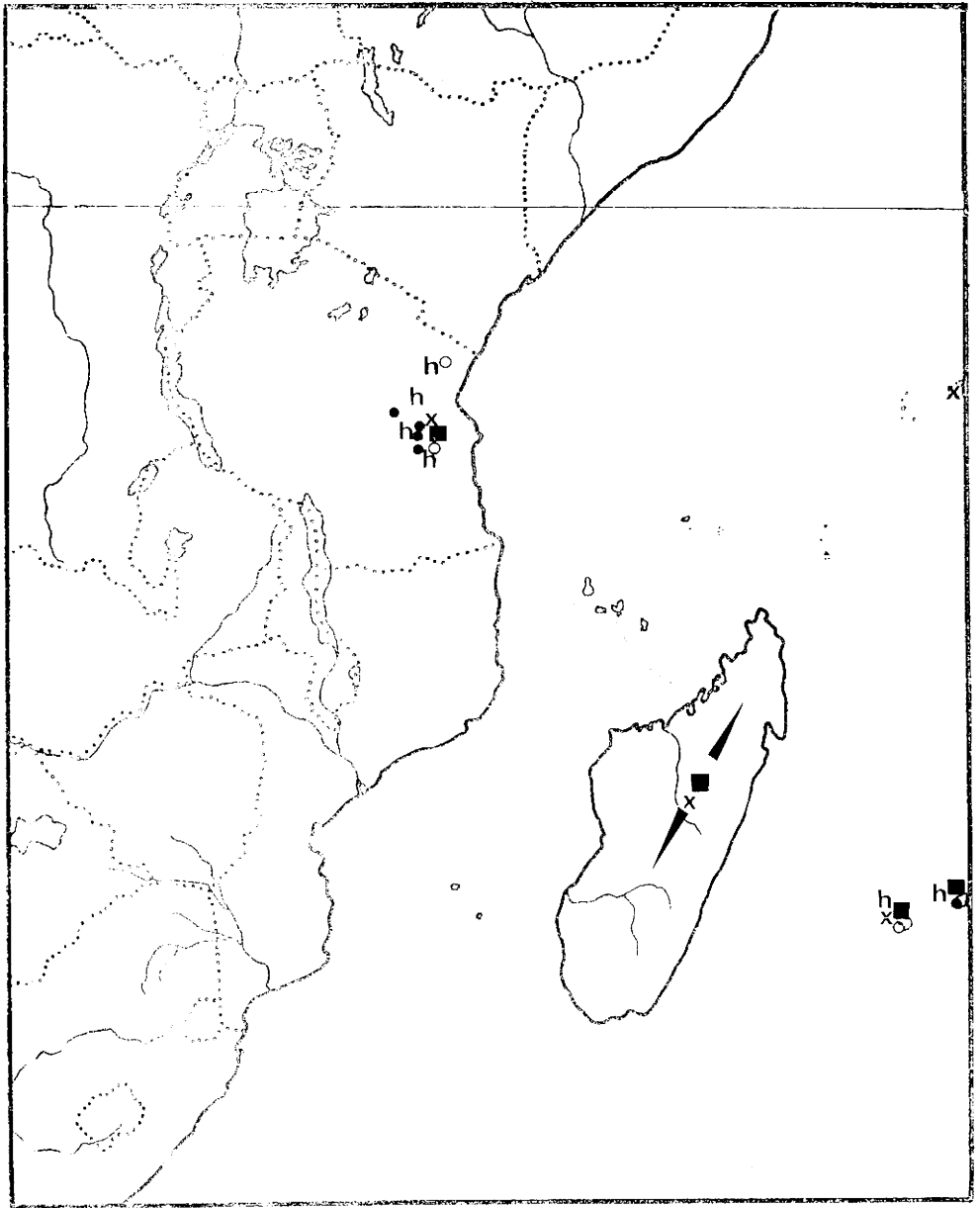
**Lowland forest elements** usually widely distributed in West and in Central Africa. (Map 5.): However, in East Africa they are restricted either to the coastal belt or to the eastern foothills and rainy slopes of the Usambara Mts. or other crystalline massifs: *Lophocolea congoana*, *Cololejeunea auriculata*, *C. furcilibulata*, *C. pusilla* var. *obtusifolia*, *Caudalejeunea africana*, *Archilejeunea abbreviata*, *Prionolejeunea serrula*, *Lep- tolejeunea quintasii*, *L. thoméensis*, *Ceratolejeunea jungneri*, *Cheilolejeunea silvestris* var. *involuta*, *Euosmolejeunea brachytoma*, *Calymperopsis subdisciforme*, *Calymperes intralimbatus*, *C. perrottetii*, *Bryum areoblastum*, *Leucomium golungense*, *Clastrobryella foliicola*, *Trichosteleum mamillipes*, *T. perhamosum*, *Taxithelium subrotundatum*, *Ectropothecium revolutum*, *Taxiphyllum gabonense*, *Vesicularia nigeriana*. Lowland elements known only from East Africa: *Cololejeunea adhaesiva*, *Brachy- menium variabile*, *Schlotheimia schweinfurthii*.

**South East African elements:** *Scistochila limbata*, *Mastigolejeunea rhodesica*, *Tortella opaca*, *Erpodium hanningtonii*.

**Species common to Madagascar or Mascarenes and East Africa** (Map 6): *Bazzania borbonica*, *Chiloscyphus mascarenensis*, *Radula holstiana*, *Porella triquetra*, *Cololejeunea bidentula*, *C. xaverii*, *Diplasiolejeunea cornuta*, *D. runssorensis*, *Dicranolejeunea cambouena*, *Cheilolejeunea silvestris* var. *silvestris*, *Riccardia saccatiloba*, *Microdus minutus*, *Campylopus fusco-luteus*, *Leucoloma bifidum* L. *brotheri*, *L. cuneifolium*, *L. sinuosulum*, *Leucobryum mayottense*, *Leucophanes hildebrandtii*, *L. rodriguezii*, *Syrrhopodon lepervenchei*, *S. sparsus*, *S. spiralis*, *Calymperes sanctae-mariae*, *Hyophila potieri*, *Weisiopsis plicata*, *Racomitrium plicatum*, *Orthodontium loreifolium*, *Brachymenium capitulatum*, *Anomobryum laceratum*, *Bryum homalobolax*, *Macromitrium mauritianum*, *Schlotheimia malacophylla*, *Racopilum plicatum*, *Hildebrandtiella pachyclada*, *Pilotrichella isleana*, *P. perrobusta*, *Aerobryidium subpiligerum?*, *Distichophyllum mascarenicum*, *Brachythecium atrotheca*, *B. afroglareosum*, *Heterophyllum flexile*, *Warburgiella leptorrhyncha*, *Sematophyllum sinuo-*

←  
Map 5. Distribution of African lowland forest elements.

*Leptolejeunea quintasii* Steph. (light shaded); *L. thoméensis* (Steph.) Steph. (dark shaded); *Ceratolejeunea jungneri* Steph. (C); *Clastrobryella foliicola* P. de la Varde (O); *Trichosteleum perhamosum* (C. Muell.) Broth. (T) and of *Vesicularia nigeriana* Broth. et Par. (V).



Map 6. Species of Madagascar—Mascarene distribution.  
*Bazzania borbonica* Steph. (full square); *Chiloscyphus mascarenensis*  
 S. Arnell (full circle); *Syrrhopodon lepervenchei* Besch. (open circle);  
*Macrohymenium acicodon* (Mont.) Dozy et Moelk. (X); *Hildebrandtiella*  
*pachyclada* Besch. (II).

*sulum*, *Macrohymenium acicodon* (Asian genus), *Polytrichum subformosum*.

**Madagascar-East African elements** occurring also in South Africa: *Jamesoniella purpurascens*, *Leucobryum isleanum*, *Macromitrium tristatosum*, *Leucodon capensis*, *Prionodon ciliatus*, *Orthostichopsis subimbricata*, *Squamidium biforme*, *Papillaria africana*, *Eriopus asplenioides*, *Thuidium borbonicum*, *Entodon geminidens*.

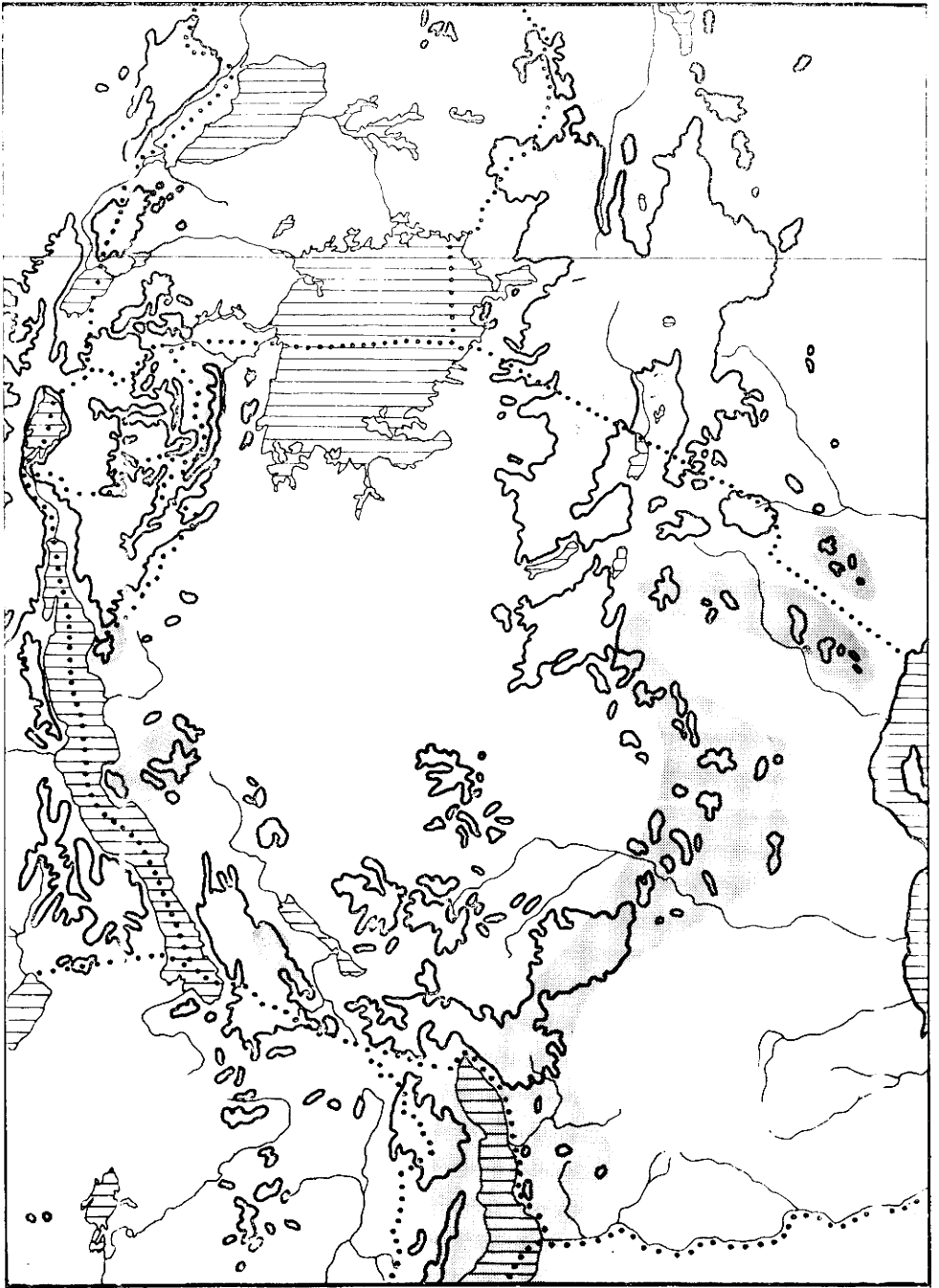
These two groups are highly interesting from biogeographical point of view. Most of them were not known before from continental or East Africa. 41 out of the 57 species are restricted in East Africa to the area of the old cristalline „Inselberge”, only 4 are limited to the young volcanic area. These old cristalline massifs, where they coincide with favourable climatic conditions at the eastern edge of the great Central African Plateau, form a chain of forest covered inselbergs from S Kenya through Tanzania to Malawi. (Taita, Maungu and Kasigau Hills in Kenya, Pare, Usambara, Kanga, Nguru, Ukaguru, Uluguru, Usagara and Uzungwe Mts. in Tanzania, Nyika Plateau and Mulanje Mts. in Malawi. The Cherangani Hills in North Kenya, the Ruwenzori Mts. themself, and the Gorongosa and Inyanga Mts. near the Mozambique — Rhodesia border also may belong to this group. (See Map 7). The analysis of the phenomenon, that most Madagascar elements, which occur in East Africa, are restricted to the area of these hills and do not occur in the volcanic mountains, probably will shed light on some problems of the relations between the continental and insular East African floras.

**West African insular elements**, partly common with Madagascar as well: *Cololejeunea leloutrei*, *Euosmolejeunea montagnei*, *Syrrhopodon quintasii*, *Tayloria thoméana*, *Regmatodon secundus*, *Mittenothamnium fruticellum*.

**Elements of Mediterranean and Atlantic Europe** with disjunction in the East African mountains, like *Erica arborea* among the phanerogams. This interesting group occurs mostly on the young volcanoes in East Africa and may be more widespread in South Africa: *Lophocolea fragrans*, *Gongylanthus ericetorum* (also in W Africa), *Barbula rigidula*, *Bryum canariense*, *Bartramia stricta* (+ Colorado, California), *Pterogonium gracile* (+ California), *Leptodon smithii* (+ Colorado, Chile, Australia, New Zealand), *Haplocladium angustifolium*.

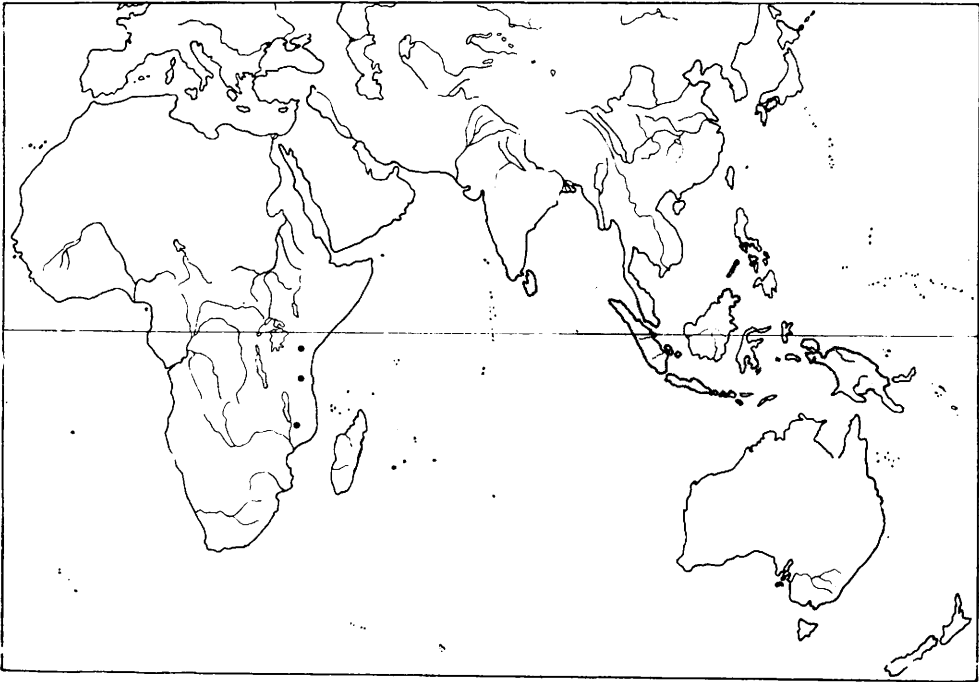
Widely distributed **Tropical African elements**: *Plagiochila fusifera*, *P. heterostipa*, *Cololejeunea africana*, *C. bolombensis*, *C. cristata*, *C. duvignaudii*, *Diplasiolejeunea albifolia*, *Odontolejeunea tortuosa*, *Caudalejeunea hanningtonii*, *Mastigolejeunea carinata*, *Phragmilejeunea molleri*, *Cheilolejeunea newtonii*, *Cheilolejeunea principensis*, *Lejeunea grosse-dentata*, *L. isophylla*, *L. kamerunensis*, *L. setacea*, *Racopilum africanum*, *Taxilejeunea conformis*, *Brachymenium borgenianum*, *Acropodium megasporum*,

→  
Map 7. Old cristalline massifs in East Africa with more or less continuous montane forest belts and with bryofloras rich in Madagascar—Mascarene, subantarctic and other disjunct elements. Contours at 1500 m.



*Floribundaria patentissima*, *Callicostella africana*, *Erythrodontium subjulaseum*, *Trachyphyllum fabronioides*, *Isopterygium m'bangae*, *I. sericifolium*? Also in South Africa: *Calypogeia fusca*, *Lophocolea concreta*, *Plagiochila crispulo-caudata*, *Pythocoleus pappeanus*, *Lejeunea eckloniana*, *L. flava* ssp. *tabularis*, *L. letabaensis*, *Riccardia fastigiata*, *R. limbata*, *Tortula hildebrandtii*, *Macromitrium levatum*, *Aerobryidium subpiligerum*, *Porotrichum comorense*, *Porothamnium hildebrandtii*, *Cyclodictyon vallis-gratiae*, *Fabronia pilifera*, *Acanthocladium trichocolea*, *Ectropothecium regulare*, *Vesicularia galericulata* (+ Eur.?)

**Palaeotropical elements**, distributed both in Asia and Africa. (When they have a wider tropical Asian-Oceanian distribution and only disjunct in East Africa, marked by As (See Map. 8.): *Mastigophora dicladus*, *Conoscyphus trapezoides* — As, *Chandonanthus hirtellus*, *Gottschelia schizophleura* — As, *Cuspidatula contracta* — As, *Pleurozia gigantea* — As, *Porrella madagascariensis* — As, *Frullania serrata*, *Cololejeunea himalayensis*, *C. peraffinis* var. *elegans* — As, *Ptychanthus striatus*, *Leptolejeunea epiphylla* — As, *Metzgeria elliotii*, *M. madagassa*, *Cyathodium africanum*, *Ditrichum difficile* — As, *Campylopodium euphorocladum* — As, *Semibarbula orientalis*, *Trachypus appendiculatus* — As, *Trachypodopsis ser-*



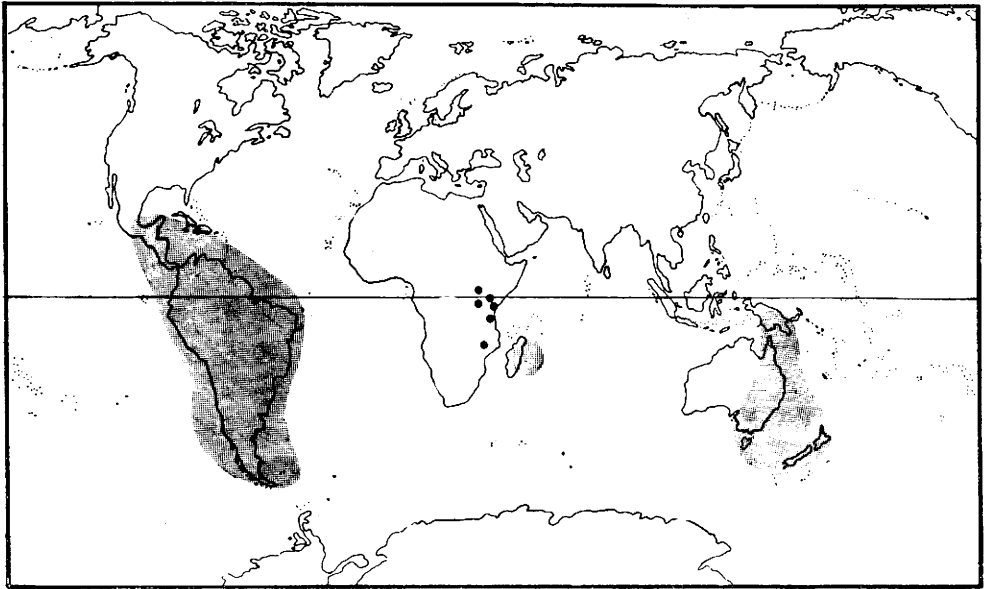
Map 8. Distribution of *Gottschelia schizophleura* (Spruce) Grolle, an Asian element with disjunct East African occurrence. (Partly after Grolle 1971.)

*rulata*, *Floribundaria floribunda* — As, *Neckeropsis lepineana*, *Daltonia angustifolia*, *Hypnum aduncoides* — As.

Elements common with **tropical America**: *Kurzia verrucosa*, *Arachniopsis diacantha*, *Marsupidium limbatum*, *Clasmatocolea vermicularis*, *Radula flaccida*, *R. stenocalyx*, *Cololejeunea cardiocarpa*, *Leucolejeunea unciniloba*, *Symphogyna podophylla*, *Leptodontium stellatum*, *Leiomela bartramioides*, *Leskeodon mniifolium*, *Hypopterygium viridissimum*, *Thuidium involvens*, *Stereophyllum radiculosum*, *Rhacopilopsis trinitensis*. Until on species level are much less common elements with tropical America in East Africa, than in West Africa, there are many genera with American affinity, as *Pilotrichella*, *Odontolejeunea* and several genera in *Pterobryaceae* family. The „American” elements in East Africa are either montane species occurring in the South American Andres, at lower altitude in Tierra del Fuego and South Africa, and again montane in East Africa (as *Clasmatocolea vermicularis*); or widely distributed tropical elements (as *Stereophyllum radiculosum* or *Rhacopilopsis trinitensis*).

**Subantarctic elements**, distributed in temperate S America, Australia and sometimes New Guinea, New Zealand and on the subantarctic isles, finally in South Africa and in the East African mountains (Map. 9.): *Bazzania convexa* (if identical with *B. nitida*), *B. decrescens*, *Metzgeria violacea*, *Dicranoloma billardieri*, *Rhacocarpus purpurascens*, *Catagonium nitens*.

**Very disjunct elements**: *Gymnomitrium laceratum*, *Adelanthus decipiens*, *A. lindenbergianus*, *Brachymenium philonotula*.



Map 9. Distribution of a subantarctic element in the East African bryoflora: *Rhacocarpus purpurascens* (Brid.) Par.

**Pantropical elements:** *Lophocolea muricata*, *Radula boryana*, *Frullania arecae*, *F. nodulosa*, *F. squarrosa*, *Cololejeunea appressa*, *Diplasioejeunea brachyclada*, *Leucolejeunea xanthocarpa*, *Lejeunea caespitosa*, *Octoblepharum albidum*, *Anoetangium hanningtonii*, *Leptodontium viticulosoides*, *Bryum coronatum*, *B. truncorum*, *Rhizogonium spiniforme*, *Philonotis hastata*, *Solmsiella biseriata*, *Zygodon intermedius*, *Rhachithecium perpusillum*, *Groutiella tomentosa*, *Braunia secunda*, *Trachypus bicolor* var. *viridulaus*, *Sematophyllum caespitosum*.

**Cosmopolites** (montane or oceanic character indicated by **mt** and **oc**): *Pallavicinia lyellii* — **oc**, *Telaranea sejuncta* — **oc**, *Metzgeria hamata* — **oc**, *Dumortiera hirsuta* — **oc**, *Ceratodon purpureus*, *Distichium capillaceum* — **mt**, *Campylopus polytrichoides* — **oc**, *Weisia controversa*, *Oxystegus cylindricus*, *Trichostomum crispulum*, *Tortella caespitosa*, *Bryum alpinum*, *B. argenteum* var. *lanatum*, *Bryum capillare* and ssp. *torquescens*, *B. pseudotriquetrum*, *Mnium rostratum*, *Bartramia halleriana* — **mt**, *Hedwigia ciliata* (alpine element in East Africa), *Platyhypnidium riparioides* (alpine in E Africa), *Oxyrrhynchium praelongum*, *Hypnum cupressiforme* (altimontane in E Africa).

### List of species collected

In the enumeration, after the name of each species, the usual habitat is given, where it occurred, than the locality, using the following abbreviations:

**Abe:** Aberdare Mts. in Kenya

**E:** Eastern slope or side

**EUs:** Eastern Usambara Mts.  
in Tanzania

**F. R.:** Forest Reserve

**Kan:** Mt. Kanga in Tanzania

**Kas:** Mt. Kasigau in SE Kenya

**K:** Kenya

**Ken:** Mt. Kenya

**Kib:** Kiboriani Mts. in Tanzania

**Kil:** Kilimanjaro Mts. in Tanzania

**Kip:** Kipengere Range in Tanzania

**Mer:** Mt. Meru in Tanzania

**Mul:** Mulanje Mts. in S Malawi

**N:** Northern (slope or side)

**Ngo:** Ngorongoro crater in T.

**Ngu:** Nguru Mts. in Tanzania

**Por:** Poroto Mts. in Tanzania

**Run:** Rungwe Mts. in Tanzania

**S:** Southern (slope or side)

**Sag:** Sagala Hills in SE Kenya

**Shi:** Shimba Hill in SE Kenya

**SHI:** Southern Highlands of T.

**SPa:** South Pare Mts.

**T:** Tanzania

**Tai:** Taita Hills in SE Kenya

**U. F. R.:** University Forest Reserve  
near Mazumbai in the WUs.

**Uka:** Ukaguru Mts. in Tanzania

**Ulu:** Uluguru Mts. in Tanzania

**Uzu:** Uzungwe Mts. in Tanzania

**W:** Western (slope or side)

**WUs:** West Usambara Mts.

**Z:** Zambia

After the brief description of locality follows the altitude above sea level in metres, then the indication of the substratum, used the following abbreviations:

te: terricolous  
 rc: on roadcut, roadside bank  
 ru: rupicolous  
 tu: turficolous  
 li: lignicolous  
 ct: corticolous  
 ra: ramicolous  
 ph: epiphyllous

mu: muscicolous  
 Ba: on bamboo stem  
 Cy: on tree fern stem  
 Er: on *Ericaceae* bark  
 Se: on giant *Senecio* stem  
 Pa: on *Pandanus* stem  
 Ve: on *Velloziaceae* stem

These are followed by the collector's name, unless he was T. Pócs, using the following abbreviations:

F: Mr. R. B. and Mrs. A. J. Faden former Miss A. J. Evans, often accompanied by the collaborators of the East African Herbarium, as by Messrs. P. Holland, B. Kariuki, D. Kichoi, A. S. Mahasi, F. Msafiri, F. S. Mwenda and by N. Smeenk.

J: E. W. Jones

A: A. D. Q. Agnew

M: D. J. Mabberley

R: L. Ryvar den

The collecting numbers in brackets, without the indication of the collector before, are of T. Pócs. These are used also by the collections he made together with others. Each collecting number represent one locality. The letters, which follow the number, are given to the different species from the same habitat. T. Pócs, during his trips was often accompanied by prof. B. J. Harris (Nos. 6020—6031, 6073—6119, 6121—6133, 6143—6188, 6254—6264, 6586—6593, 6037—6038); by Dr. E. W. Jones during a long journey from No. 6301 to No. 6383; by Dr. D. J. Mabberley (Nos 6396—6400 and 6730—6757), R. B. Faden (6216—6218 and 6254—6262), partly also by Miss A. Evans and Miss Ch. Kabuye; by professors A. and J. Kornas (Nos 6609—6627, 6512—6534 and 6809—6830); by Mr. and Mrs. M. R. and C. A. Crosby (Nos 6840—6857); by H. J. Schlieben (Nos. 6428—6446) and by A. Björnstad (Nos. 6493—6501 and 6703—6710) as co-collectors; by his assistants P. S. Mwanjabe and M. Lung'wecha, colleagues and friends, as Dr. D. P. Gibbon, P. Lawrence, Dr. B. Ogle, S. Salehe, R. and S. Sharma, Mrs. Tanner, Mrs. and Dr. G. Füleky, Dr. J. Kundaeli, D. Vesey-Fitzgerald, P. and K. Csontos, Ch. Paget-Wilkes, Mr. and Mrs. J. and A. Lundqvist, L. Mezósi, L. Horváth, G. Várбірó; by his students (K. B. G. Nchimbi, D. M. Chambuko, J. C. Kondela and others) and by members of his family as well. He expresses his gratitude to all these people who helped him in his collecting work. His locality numbers were dated from the following periods:

6001—6109	1969	Tanzania	6601—6608	1971	Kenya
6110—6356	1970	Tanzania	6609—6630	1972	Zambia
6357—6501	1971	Tanzania	6700—6868	1972	Tanzania
6502—6599	1972	Tanzania	6869—6916	1973	Tanzania



After the collecting number the name of the identifier is abbreviated, as follows: B — M. Bizot

G — R. Grolle	P — T. Pócs
J — E. W. Jones	JV — J. Váňa
C — M. R. Crosby	VB — C. Vanden Berghen

After the enumeration of the new localities, the known distribution of species is given in brackets, using the following abbreviations: (see also the abbreviations on page 397.)

Ang: Angola	Réu: Réunion Isl.
Ann: Annobon Isl.	RCA: République Centoafricaine
Bur: Burundi	Rho: Rhodesia or Zimbabwe
Cam: Cameroon	Rod: Rodriguez Isl.
EAF: East Africa	Ruw: Ruwenzori Mts.
Elg: Mt. Elgon	Rwa: Rwanda
Eth: Ethiopia	SAf: South Africa
F—P: Fernando—Poo	Sey: Seychelles
Gab: Gabon	Som: Somalia
Gui: Guinea	S—L: Sierra-Leone
Kar: Mt. Karisimbi	S—T: Sao Tomé Isl.
Kat: Katanga	S—H: St. Helene Isl.
Lib: Liberia	Swz: Swaziland
Mad: Madagascar	Tvl: Transvaal
Mal: Malawi	TdC: Tristan da Cunha Isl.
Mas: Mascarene Isls.	Uga: Uganda
Mau: Mauritius	Usa: Usagara Mts.
Moz: Mozambique	Usb: Usambara Mts.
Muh: Mt. Muhavura	Vir: Mt. Virunga
NAf: Extratropical North Africa	Waf: Tropical West Africa
Nat: Natal	Zre: Zaire
Nig: Nigeria	Zul: Zululand

## H E P A T I C A E

1. **Blepharostoma trichophyllum (L.)** Dum. — Subalpine *Erica* forest.

**Kil:** Umbwe route, 2900m, li (6788/CK) det. P. (Widespread in the northern temperate zone, disjunct in tropical mountains: Central America, Java, New Guinea; in Africa only: Ruw 3150—3900m, Muh 3350—3900m, Mer 3400 m)

2. **Mastigophora diclados** (Brid.) Nees — Submontane rain forest.

**Ulu:** Mt. Tumbako SE 1000m, ct (6264/B) det. J. (Widespread in Indo-malaya and Oceania. In Africa: S—T, Cam, Gab, Usa, Usb, Mad, Réu, Mau)

3. **Arachniopsis diacantha** (Mont.) Howe — Forests from submontane to subalpine region. **EUs:** Amani 950m, li (6091/A) det. P. **Ulu:** Mkungwe

F. R. 800m, te (6132/E) det. P; Bondwa top 2100m, te (6262/B) det. P; Lupanga crest, 2000—2100m, te (6132/E) det. P. (Brazil, Peru, Cuba. In Africa: Mad, Cape, Rho, Zre, T: Amani)

4. **Telaranea sejuncta** (Angstr.) S. Arnell — Montane forest. **Kil:** Above Mandara (Bismarck) hut, 2700m, te (6144/E) det. P. (Subcosmopolite with oceanic character. In Africa: Gab, Zre, Cape, Tvl, Nat)

5. **Kurzia verrucosa** (Steph.) Grolle — Montane mossy and subalpine elfin forest. **Ulu:** Lupanga SW 1700—1900m, S 1850—2000m, top 2140m, te (6285/BC, 6287/F, 6132/D) det. P. revid. G. (Jamaica, Puerto Rico, Guadeloupe, Dominica, Guatemala, Columbia, Venezuela, Brazil. New for Africa.)

6. **Bazzania nitida** (Web.) Grolle Syn.: *B. convexa* (Thunb.) Mitt. — Montane mossy forests. **Kil:** Mweka route, 1900—2150m, ct (6344/K, T, U, AT, 6343/C) det. J; Umbwe route, 1600—1900m, ct (6190/B, 6351/L) det. J. **WUs:** U. F. R. 1600—1880m, li (6371/T, 6372/TA) det. J. **Ulu:** Bondwa N, 1800—1900m, ct (6012/BB, BE 6308/C) det. P. (South America from Brazil to Patagonia, Australia, SAf, Kil, Mad, Mas.)

7. **Bazzania decrescens** (Lehm. et Lindenb.) Trev. Syn.: *B. adnexa* (Mont.) Trev., *B. boschianum* Steph. — Montane mossy forests. **Kil:** Mweka route, 2150m, ct (6344 S, TA, UA) det. J. **WUs:** U. F. R. 1600—1800m, ct, li (6371/V, 6372/X, Y, BO) det. J. **Ulu:** Bondwa N 1800—2000m, ct (6012/AE, AP, AG, BA, BC 6308/B) det. J. and P. **Por:** Lake Ngozi crater E 2200m, ct (6329/U) det. J. (Ruw, Nat, Tvl, Comores, Réu, Mau, Australia, Tasmania, New Zealand)

8. **Bazzania borbonica** Steph. — Subalpine elfin forest. **Ulu:** Top of Bondwa 2120m, te, ct (6309/W) det. J. (Mad, Réu, Mau. New for continental Africa)

9. **Bazzania laxifolia** (Steph.) Demar — Subalpine *Erica* forest. **Kil:** Above Mandara hut, 2800m, (6245/O) det. J. (Ruw, Muh 3300—4200m)

10. **Calypogeia fusca** (Lehm. et Lindenb.) Steph. — **Kil:** Umbwe route 2850—2900m, in *Sphagnum* cushions (6788/CW) det. P; Kimafu V. near Nkweseko 1850m, ru (6360/E) det. J. (Açores, Eth, Ruw and Toro in Uganda, Cape, Tvl, Swz, TdC, S—H, Sey.)

11. **Lophocolea concreta** Mont. Syn.: *L. subrotunda* Mitt. — Montane forest. **Mer:** Malama, 1800m, li (6338/N) det. J. (Cape, Nat, Tvl, Nig, Moz, Swz, T: Amani, Mad, Mau, Rod)

12. **Lophocolea congoana** Steph. Syn.: *L. amanica* St., *L. newtonii* St. — Submontane and montane forests. **EUs:** Amani 920m, ct (6377/H) det. J. **WUs:** U. F. R. 1600—1750m, te (6371/B) d. J. (Princes Isl., Nig, Cam, Zre, T: Amani)

13. **Lophocolea difformis** Nees Syn.: *L. molleri* Steph. — Montane forests. **Tai:** Mbololo hill 1700—1800m, ph, coll. F (71/1020/V) det. P. **Kil:** Weru Weru v. near Kissereni 1260m, ru (6345/C) det. J. **Ulu:** Morningside, 1260m, te (6311 M) det. J. (S—T, Cam, Eth, Muh, Ruw, Elg, Tvl, Nat, Cape, Rou, Mas.)

14. **Lophocolea fragrans** (Moris et De Not.) Gott., Lindenb. et Nees — **Kil:** Maua, betw. Marangu and Old Moshi, 1750m (6368/G) det. J.

(Norway, Britain, France, Italy, Corse, Morocco, Canary Isls., Madeira, Açores, Cape, WUs 1200—1300m)

**15. *Lophocolea lucida*** (Spreng. ex Lehm.) Mont. — Montane forests. **Kil:** Mweka route 2150m, li (6344/LM) det. J; Nkweseko 1800—1850m, (6359/D) det. J. **WUs:** U. F. R. 1600—1750m, li (6371/Q) det. J. (S—H, Cam, Cape, Rod, Réu, Comores, Mad)

**16. *Lophocolea muricata*** Nees — Montane forest. **Ulu:** Lupanga S 1700—1900m, mu (6285/U) det. P; Bondwa NE 1750m, NW 1950m, Cy, ph (6537/Q, 6051/BM) det. P. **Uka:** Mandege 1500—1650m, mu, coll. M (1351/B) det. P. (Tropical Asia and America, in Africa: Cam, Ruw, Cape.)

**17. *Clasmatocolea vermicularis*** (Lehm.) Grolle — **Run:** Mt. Kyejo, E of Tukuyu town, 1725m, rc (6769/B) det. JV. (Andes and temperate S America from Costarica to Tierra del Fuego, Juan Fernandez Isls., S. Georgia, TdC, in Africa: Cape, Nat, Tvl, Réu see map of Grolle 1969.)

**18. *Chiloscyphus dubius*** Gott. — Subalpine *Philippia* heath. **Kil:** Shira Plateau NW above Wasendo Glades 2700m, te (6354/C) det. J. (Principe Isl., Togo, Nig, Cam, Zre, T: Usb, Nat, Mad, Réu, Rod.)

**19. *Chiloscyphus mascarenensis*** S. Arnell — Subalpine elfin forest. **Ulu:** Bondwa top, 2100—2125m, ra (6012/K, 6052/CF, 6847/M) det. G; Lupanga SW 1700—1900m, S 1850—2000m, Lupanga crest 2000—2140m, ra (6285/BP, 6287/E, 6072/V, 6552/C) det. P; Lupanga — Kinazi ridge 1800—1900m, ra (6836/X) det. P; Palata NW 1850—1900m, ra (6852/T) det. P; Lukwangule plateau, W and S edge, 2400—2500m, ra (6080/AR, 6825/P); Magari peak 2340m, ra (6300/AC) det. P; above Kibungo Mission, 1730m, ra det. P; (6477/H) det. P; top of Mt. Kifuru N of Bunduki, 2010m, ra (6915/L) det. P. **Uka:** Mnyera ridge, 2120m, ra (6740/P) det. P. (New to continental Africa, known only from the type locality: Mau, 540m)

**20. *Chiloscyphus muhavurensis*** S. Arnell. The author of this handsome species later published (S. Arnell 1959: 543—544) Grolle's opinion, that this species should be transferred into *Lophocolea*. However, this new combination is not communicated validly yet. — Subalpine *Erica* forest. **Kil:** Umbwe route, 2850—2900m, on wet rocks, among *Sphagnum* and other mosses (6788 BM) det. P; **Abe:** Aberdare National Park, Queens waterfall, on rocks in the spray zone, coll. A (136/B) det. P; (Muh 3350m, Ken 3450m, also from Kilimajaro published by S. Arnell 1956: 527 without certainty, based on the publication of Jones 1953: 199—200 about an extreme form of *Leptoscyphus infuscatus*.)

**21. *Conoscyphus trapezoides*** (Sande—Lac.) Schiffn. — Subalpine elfin forests, montane mossy forests. **Ulu:** Lupanga NW 1710m, ru, S 2000m, ra (6069/K, 6467/F) det. G; Lupanga crest 2000—2100m, ra (6132/C) det. P.; Lupanga — Kinazi ridge 1800—1900m, ra (6836/J) det. P; Bondwa NW 2050m, SE 2000—2100m, top 2125m, ra (6230/O, 6261/N, 6847/G) det. P; Magari peak 2345m, ra (6300/AB) det. P. (Widespread in tropical Asia, disjunct in Africa: S—L, Mas)

**22. Tritomaria exsecta** (Schmid.) Schiffn. — Subalpine *Erica* forest. **Kil:** Umbwe route, 2850—2900m, li, associated with *Blepharostoma trichophyllum* (6788 CL) det. JV. **Elg:** N slope of Koitobbos, 3900m, coll. Hedberg (887 e) in 1948, det. G. (Europe, Asia: Siberia, Himalaya, China, Taiwan, Japan, Borneo on Mt. Kinabalu, North America, Maderia. New to tropical Africa.)

**23. Chandonanthus hirtellus** (Web.) Mitt. — Montane forests and subalpine *Erica* forests. **Mer:** E crater edge, 2600, ct (6341/G) det. J. **Kil:** Umbwe route, 2700m, te, transitional form to ssp. *giganteus*, det. P. **Ulu:** Lupanga NW 1700m, ru (6069/A). **Run:** Mt. Kyejo N 1700m, ru (6670/B) det. P. (Widespread in tropical SE Asia and Oceania, see map of Pócs 1971:852, in Africa: Cam, Ruw, Rwa, Kil, Usb, Run, Mul, Tvl, Mad, Réu)

**24. Chandonanthus hirtellus** ssp. *giganteus* (Steph.) Vanden Berghen — Subalpine *Erica* forest and *Philippia* heath, above 2700m. **Kil:** Mweka route 3450m, te (6720 F) det. P; Umbwe route 2850—300m, ru (6788 BK) det. P. (Ruw, Kar, Abe, Ken, Kil, 2700—400m.)

**25. Chandonanthus cavallii** (Gola) S. Arnell. Syn.: *Ch. quadrifidus* Steph., *Ch. setiformis* auct. non (Ehrh.) Lindb. Subalpine *Erica* forest and *Philippia* heath. **Kil:** Umbwe route 2850—2950m, on *Erica* and *Podocarpus milanjanus* bark (6788 CB) det. P; near the Barranco hut, 3800m, ru (6792/R) det. P; S slope between Umbwe and Weru-Weru rivers, 3150m, in a *Herberta* specimen collected by P. J. Greenway in 1932 (3157, East African Herbarium) det. P. (Ruw 3300—4250m, Kar 3400m, new for Kilimanjaro Mts.)

**26. Anastrophyllum gambaragarae** Gola — Subalpine *Erica* forest and *Philippia* heath, alpine *Helichrysum* and *Senecio cottonii* community. **Kil:** Mweka route 2820m, Er, 3275m, ru (6718/CC, 6720/K) det. P; Umbwe route near the Barranco hut, 3600—4000m, ru, tu (6792 D, 6793 F, 6796 G, 6798/D) det. P; **Run:** E 2500—2600m, Er. (6504/N) det. JV. (Ruw. Muh, Nyiragongo, Kar, Elg, Abe, Ken, Mer, Kil 3200—4000m; Natal 2400—3000m, Cape 1650—1800m.)

**27. Marsupidium limbatum** (Steph.) Grolle Syn.: *Tylimanthus limbatum* Steph. — Montane forest. **Kil:** above Nkweseko village, 1800m, ct (6359/F, AE) det. J. (Patagonia, South Africa)

**28. Adelanthus decipiens** (Hook.) Mitt. Syn.: *Pseudomarsupidium decipiens* (Hook) Grolle — Subalpine *Erica* forest and elfin forest, montane mossy forest. **Kil:** Marangu route below Mandara hut. 2200—2650m, Er (6240/R, 6365/Q) det. P; Mweka route 2150m, li (6344/AP) det. J; Umbwe route 17000—1900m, ct (6351 AC) det. P. **Ulu:** Bondwa SE 2120m, ct (6261/A) det. P. **Uka:** Mnyera ridge 2120m, ct (6740/O) det. P. (Britain, NW France, Açores, Antilles, South American Andes, TdC, S—H, F—P, Cam, Cape, Tvl, Mau)

**29. Adelanthus lindenbergianus** (Lehm.) Mitt. Syn.: *A. unciiformis* (Tayl.) Mitt., *A. sphalerus* (Hook. et Tayl.) Mitt. — Montane mossy forest, subalpine *Erica* forest. **Kil:** Mweka route, 2530—2700m, Er, li (6718/AB,

AD) det. P, revid. G; Umbwe route 2700—2900m, Er, Podocarpus bark, li (6788/BC, 6194/J) det. P. **WUs:** U. F. R. 1750—1880m, ct (6372/T) det. P. (W Ireland, Andes from Mexico to Tierra del Fuego, Falkland Isls.. Juan Fernandez Isls., TdC, in Africa: Cape: Ruw, Mad, Réu. See map of Grolle 1969:576.)

**30. Leptoscyphus infuscatus** Mitt. — Montane mossy forest. **Kil:** Mweka route, 2150m, ct (6344/P) det. J; Umbwe route 1900—2100m, te (6352/S) det. J. (F—P 2600m, Cam 2000—3300m, Eth, Ruw 2300—3300m, Nyiragongo 1800m, Mul 1800m, Inyanga 2000m, Réu 600—1000m, ? Java)

**31. Gymnomitrium laceratum** (Steph.) Horik. Syn.: *G. elgonense* S. Arnell — Subalpine *Philippia* heath. **Kil:** Umbwe route near the IInd Bivouac, 3600m, mu, in *Anastrophyllum gambaragare* mats (6792/U) det. P. (Japan, USA, Mexico, Peru, Cape, Nat 2400—2700m, Elg 4200m, Ruw 3900m — see Sharp and Hattori 1967:105—106 and 131.)

**32. Gottschelia schizopleura** (Spruce) Grolle Syn.: *Anastrophyllum schizopleurum* (Spruce) Steph. — Montane forest and *Philippia* heath. **Kil:** Umbwe route, 1850—2200m, rc (6190 H, 6191/V, 6352/AX) det. J, revid. JV and G. **Ulu:** Bondwa N 1600—2080m, rc (6307 D, 6308/A, 6714 D, 6897/A) det. J. **Mul:** 200—2020m, coll. Humbert 1937, det. G, Likabula V. 900—1600m, coll. R (1131 C), det. JV. (New for continental Africa. Mad: Ankaratra, Réu, Cey, Inida: Madura, W Sumatra, W Java, Philippines, Ternate, Celebes, New Guinea.)

**33. Cuspidatula contracta** (Reinw. et al.) Steph. — Submontane, montane and subalpine forests. **Ulu:** Tumbako SE 1000m, ct (6264/A) det. G; Bondwa top 1950—2100m, te ct (6011/N, 6012/BM) det. G; Lupanga S 1800—1900m, ra (6832/D) det. G. **Uka:** Mnyera ridge 2120m, ct (6740/T, V) det. G. (New to continental Africa: Sey, Mau fide Grolle, Thailand, Java, Sumatras, Philippines, Amboina, New Guinea, Samoa, Fiji, Tahiti, Cook Archipel.)

**34. Jamesoniella purpurascens** Steph. Rocks in montane forest. — **Ulu:** Lupanga W 1600—1800m, m. (6548/H) det. JV, revid. G. (Cape, Tvl, Mad, Réu, Mau.)

**35. Jungermannia abyssinica** Nees — Rocks in subalpine *Philippia* heath. **Kil:** Marangu route, below Horombo hut, 3440m, ru (6247/N) det. JV. (Eth, Kil 3000m.)

**36. Jungermannia borgenii** Steph. — Montane forests. Around waterfalls in drier environment too. **Kil:** Kimafu v. above Nkweseko, 1850m, ru (6360 S) det. JV; Kikafu v. below Kalai 1250m, ru (6348 D) det. JV; Kinukamari falls above Marangu, 1500m, ru. **Ulu:** Lupanga W 2050m, ru (6551/C) det. JV; Bondwa 2025m, te (6848/C) det. JV; Lukwangule plateau 2330—2400m, te, ru (6078/S, 6822/AP, AT) det. JV; Mgeta v. 2215m, ru (6829/X) det. JV. **Run:** near Rungwe village, 1450m, rc (6760/D) det. JV; Mt. Kyejo E of Tukuyu, 1725m, rc (6769 C) det. JV. **Z:** Kundulila falls SE of Kanona, 1480m, ru (6622/C) det. JV. (Cape, Nat, Tvl, Rho, Central Africa from Cameroon to Uganda)

**37. Jungermannia mildbraedii** Steph. — Montane forests and subalpine *Philippia* heath. **Kil:** Mweka route, 2000m, te (J1997, 6342/A) det.

JV; Umbwe route 2000—2900m, te, ru (6352/T, U,) det. JV; Marangu route above Mandara hut 2800m, te (6245/L) det. JV. (Cape, Nat, Abe, Uganda: Rugege forest, Nyiragongo)

**38. *Jungermannia sphaerocarpa*** Hook. — Montane forest and subalpine heath. **Kil:** Umbwe route 2800—2900m, ru (6788/BO, DA) det. JV. **Por:** Along the route from Isongole village to the Ngozi crater, 2000m, rc (6331/A) det. JV. (Holarctic, in Africa only: Cam, Muh, Elg, Ruw, Kil, at 3450—4400m altitude; Réu)

**39. *Lethocolea congesta*** (Lehm.) S. Arnell — Montane forests, subalpine heath, near springs or streamlets. **Kil:** Marangu route below Horombo hut, 3440m, ru (6247/M) det. JV; Mweka route, below the Base hut in Charongo v. 2985m, ru (6719/B) det. JV. **Run:** Mt. Rungwe N 2250m, te (6333/A) det. JV. (TdC, Cape, Nat, Tvl, Muh, Ruw, Elg, Ken, Mer, Kil)

**40. *Gongylanthus ericetorum*** (Raddi) Nees — Rocky vegetation and subalpine heath. **Mer:** Kitoto 2450—2600m, te (6340/L) det. P. **Z:** Kundulila falls SE of Kanona, 1480m, ru (6622/D) det. P; Muchinga Escarpment, Mt. Mukowonshi NNE of Mpika, 1900m, on dolomite rocks (6630 M) det. P. (Atlantic and Mediterranean Europe, Canary, Acores and Maderia Isls., N Af, Cam, Kat, Capes, Nat.)

**41. *Gongylanthus renifolius*** (Mitt.) Steph. According to Grolle in Jones 1964:650 only an ecological variation of the preceding species. — On wet rocks in the montane forest zone. **Ul.:** Lukwangule plateau E, near the falls of Mgeta river, 2350m, ru (6822/AE) det. P. **SHI:** Mufindi Scarp F. R. near the Fishing Camp, 1720m, te (6323/H) det. J. **Run:** Mt. Kyejo E of Tukuyu, N 1870—1970m, ru (6772/A) det. P. (Cape)

**42. *Gongylanthus richardsii*** E. W. Jones — Subalpine *Philippia* heath. **Kil:** Marangu route above Mandara hut, 3110m, te (6246/A) det. P; Mweka route above Mweka Base hut, 3300m, te (6720/W) det. P. (This taxon was known only from the type locality: Cameroon Mts. S 2550—3150m. According to Grolle it also falls within the ecological variability of *Gongylanthus ericetorum* — R. Grolle in litt.)

**43. *Plagiochila crispulo-caudata*** Gott. — Montane forest. **Ulu:** Bondwa N 1650m, ct (6006/AA) det. P. (Zre, Mal, Z, T?, Tvl, Nat, Cape, Mad.)

**44. *Plagiochila divergens*** Steph. var. **myriocarpa** (Pears.) E. W. Jones — Montane forest. **Ulu:** Bondwa N 1650m, ct (6006/R) det. P. (Zre, Ruw, Uga, il, Usb; the var.: Uga, Elg, K.)

**45. *Plagiochila effusa*** Steph. — Montane forest. **Ulu:** Bondwa N 1550—1650m, ct (6006/U, 6007/D) det. P. (S—L, F—P, Ang, Usb.)

**46. *Plagiochila ericicola*** Steph. Syn.: *P. hedbergii* S. Arnell — Subalpine *Erica* arborea forest. **Kil:** Umbwe route 2650—2850m, te, ru (6194/P, 6788/CS) det. J; Mweka route 2580—2890m, te (6718/U) det. P. (Known, as the character species of *Erica* forests on Ruw 3000—3500m, Muh 3350m.)

**47. *Plagiochila fusifera*** Tayl. Montane forests. **Tai:** Mbololo hill 1700—1800m, ph coll. F (71/1020/Z) det. P. **Ulu:** Bondwa N 1400—1650m, ct (6005/H, 6006/D) L det. P. (Gui, Nig, Gab, Zre, Uga, Som.)

48. *Plagiochila heterostipa* Steph. Montane forests. **Kas**: 1250—1400m, ph coll. F. s. n., det. P. **Sag**: 1400—1500m, ph coll. F s. n., det. P. (Zre, Bur, Mal, Nat, Cape, Mad.)

49. *Plagiochila sinuosa* Mitt. Montane forest, **Kil**: NW edge of Shira plateau above Wasendo glade, 2600m, ct (6355/C, D) det. J; Upper Kikafu v. near Kyera, on isolated trees, 1620m coll. and det. J (2115). (Ruw, Bur, Ken, Elg, Kil, WUs, Kungwe Mts. in T, 1800—2500m.)

50. *Plagiochila subalpina* Steph. — Montane mossy forest. **Ulu**: Lupanga S 1800—1900m, ra (6832/C) det. P. (Cape, Nat, Mul, Kil, Ken, Ruw, 1800—4200m.)

51. *Plagiochila terebrans* Lindenb. ex Nees et Mont. — Montane forests. **Kas**: Rukanga route, E edge of plateau 1400—1600m, ph, coll. F. s. n., det. P. **Ulu**: Bondwa N 1550m, ct (6007/B) det. P. (Ann, Cam, Zre, Bur, Uga, K; T: Bukoba, Kil, Usb, Run; Ang, Mal, Zul, Mad, Réu, Mau.)

52. *Schistochila engleriana* Steph. — Montane mossy forest, subalpine elfin forest. **WUs**: U. F. R. 1600—1880m, ct. li (6371/AA, 6372/R) det. J. **Ulu**: Bondwa top, 2120m, ct (6309/M, X, Y) det. J. (Usb)

53. *Schistochila limbata* S. Arnell, cum perianthis — **Mul**: Lichenya plateau, 1800—2000m, coll. R (11787/A) det. P. (Moz: Gorongoza Mts. near Gogogo peak, 1740m; Rho: Pungwe gorge, 1610m.)

54. *Diplophyllum africanum* S. Arnell, cum perianthis — Subalpine *Philippia* heath. **Kil**: Umbwe route 3330m, ru (6791/J) det. P. (Elg 4200m — type; Kil: Marangu route near Horombo hut, 3400m.)

55. *Pleurozia gigantea* (Web.) S. O. Lindb. — Montane mossy forest and subalpine elfin forest. **Ulu**: Lupanga NW 1700m, crest 2000—2100m, SW 1800—1900m, ra (6068/T, 6132 B, 6552/A, 6467/E, 6285/BO) det. P; Palata NW 1850—1900m, ra (6852/U) det. P; Bondwa 2100m, ra (6011/A, 6388/A, 6847/L) det. P; Magari peak 2340m, ra (6300 AA) det. P. (New for continental Africa. F—P, S—T, S—H, Mas, Ceylon, Thailand, Malacca, Burma, Vietnam, Java, Borneo, Philippines, Amboina, New Caledonia, Hawaii.)

56. *Radula boryana* (Web.) Nees—Montane forests. **Kil**: Mawingo Estate below Mweka 1350m, te (6349 J) det. J; Mweka route 2150m, ct (6344 AF, AH, AV, AS, AX, BB) det. J.; Umbwe route 2100m, ct (6353 G) det. J; Nkweseko, Kimefu v., 1850m, ct (6360/L) det. J. **WUs**: U. F. R. 1750—1880m, ru (6372 S) det. J. (Widespread in tropical America, and in East Asia. In Africa: S—T, Annm Cam, Mul, T: Usa, Moz, Rho, Swz, Tvl, Nat, Cape, Comores, Mad, Réu, Mau.)

57. *Radula capensis* Steph. — Roadside trees. **WUs**: Along the Bum-buli—Soni road near Misalai, 1500m, ct (6369/P) det. J. (Cape, Nat, Tvl.)

58. *Radula flaccida* Lindenb. et Gott. — Lowland rain forest. **Ulu**: Kimboza F. R., 300m, ph (6216/G) det. P. (Tropical America, S—T, Principe, Nig, Cam, Congo, Zre, RCA, Comores)

59. *Radula holstiana* Steph. — Submontane and montane forests. **Kil**: Maua, 1600m, ru (6368/A) det. J; Umbwe route 1900—2100m, ct (6352/O) det. J. **WUs**: U. F. R. near Kambo falls, 1620m, ru (6374 A) det. J. **Ulu**: Bondwa N 1600—1700m, ru (6119/L 6307 B) det. J. **SHI**: Mufindi Scarp

F. R., along the stream below Fishing Camp, 1720m, ru (6323/M) det. J; Lupeme Estate 1750m, ra (6218/A) det. J. (T: Usb, Lake Malawi, Ugambo; Mad, Réu.)

**60. *Radula meyeri*** Steph. — Montane forests. **Kil:** Mawingo Estate below Mweka village, 1350m, te (6349/K) det. J. **Ulu:** Bondwa N 1600—1700m, ru (6307/BA, 6307/N) det. J. (Cam, Ruw, Elg, Ken, Kil, Usb, Inyan-ga, Tvl, Nat, Cape.)

**61. *Radula recurvifolia*** Steph. — Montane forests and subalpine Philippia heath. **K:** Uplands Forest Station NE of Limuru 2350m, ct, coll. F (70/397, 405) det. P. **Mer:** E 2600m, ct (6341/A, K) det. J. **Kil:** Wasendo glade NW from Shira, 2700m, ct (6354/G) det. J; Umbwe route 2000m, ct (6352/A, B) det. J. **WUs:** Magamba—Mabweni saddle 1900, ct (6206/A) det. P. **SHI:** Mufindi 1900m, ct (6320/OA) det. J. (Cam, Eth, Ken, Kil.)

**62. *Radula stenocalyx*** Mont. — Montane forest. **Tai:** Mbololo hill 1700—1800m, ph coll. F (71/1020/U) det. P. **Kas:** Rukanga route E 1250—1600m, ph, coll. F s. n., det. P. **Sag:** 1400—1500m, ph, coll. F s. n., det. P. (Tropical America, Africa: S—T, Cam, T: Beni.)

**63. *Radula stipatiflora*** Steph. — Montane forests. **Mer:** E 2000m, ra (6339/C) det. J. **Por:** Ngozi crater rim 2200m, ct (6329/A) det. J. (F—P, Rwa, Kil, Tvl.)

**64. *Porella abyssinica*** (Nees) S. Arnell — Montane forests. **Ken:** Castle Forest Station 200m, ct (6602/D, 6605/E) det. P; Kamweti F. St. 2400—2700m, te, Ba (6601/K) det. P. **Mer:** E 2000m, ct (6339/K) det. P. **Kil:** Mandara hut, 2700m, ct and on stone walls (6242/F, 6343/L). **Ulu:** Bondwa N 1700—1900m, ct (6012/AZ) det. P. **Run:** on lava rocks at the N foot of Mt. Kyejo, 17000m (6770/A) det. P. (Eth, Eritrea, Elg, Ken, Zre, Z.)

**65. *Porella capensis*** (Gott.) Steph. with perianths. — Bamboo (*Arun-dinaria alpina*) forest and *Ocotea* forest. **K:** Kimakia F. R. coll. A (235) det. P. **Por:** Lake Ngozi crater rim 2200m, ct (6329/AS) det. P; E of Igoma village, 2575m, ct (6511/E) det. P. **Kip:** NW edge of Kitulo Plateau 2650m, ct (6750/BD) det. P. **Run:** Mt Rungwe SW 2100—2300m, (6764/F) det. P. (Cape, Nat, Tvl, T: Usb, Handeni Mts., K: Nyanza prov.)

**66. *Porella hoehnelii*** Steph. — Montane forest, subalpine *Erica arborea* forest. **K:** Kaptagat waterfall near School, 2500m, ct, coll. A (325) det. P. **Abe:** Queens's waterfall, ct, coll. A (131) det. P. **Ken:** Castle Forest Station 2000m, ct (6603/C) det. P. **Kil:** Marangu route below Mandara hut, 1850—2650m, ct, ru (6239/A, 6208/A, O, 6238/E) det. P; Mweka route 2530m, te (6718/X) det. P. **Ngu:** near Mnembule 1400m, ru (6437/B) det. P. (Eth, K, Uga, Mer, Kil, Moz, Nat, Mad.)

**67. *Porella madagascariensis*** (Nees et Mont.) Trev. — Montane forest. **Ulu:** Bondwa N above Mornigside 1450m, ct (6185/K) det. P. (New for continental Africa. Mad, S-India, Ceylon, Vietnam.)

**68. *Porella subdentata*** (Mitt.) E. W. Jones var. **subdentata** Montane forests and subalpine *Erica* forest. **Kil:** Mweka route 2830m, te (6718/BH) det. P; Maua falls near Maua village W of Marangu 1600m, ru (6367/C) det.



P. **Kib**: isolated mist forest on the top, 1900—2000m, ct (6569 J) det. P. (Gui, Nig, Cam, S—T, F—P, Gab, Zre, Ang, Uga, K.)

**69. Porella triquetra** (Steph.) E. W. Jones — Lowland and montane forests. **SHI**: Lupeme Estate 1750m, ct (6318/Q) det. P; Mufindi Scarp F. R. near the Fishing Camp 1730m, ct (6322/E) det. P. (WUs, EUs, Rho, Mad.)

**70. Frullania angulata** Mitt. var. *angulata* — Montane forests. **Mer**: E 2000m, ct (6339 J) det. VB; E edge of the crater 2600m, ct (6341 P) det. J. **Kil**: Mweka route 2150m, ct (6344H, BH) det. J; Maua E of Marangu 1700m, ct (6368 S) det. J; Umbwe route 1700—2100m, ct (6351/A, 6352 AH, AL) det. VB, J. **WUs**: U. F. R. 1750—1880m, ra, ct, te (6372/BN, 6373/E, H) det. J. **SHI**: Mufindi Scarp F. R. near the Fishing Camp 1730m, ct (6322/T) det. J; near Mufindi village 1900m, ct (6320 A) det. VB. **Por**: Lake Ngozi crater rim 2100—2200m, Ba, ra (6329 AU, 6330/N) det. J. (S—T, F—P, Ann, Cam, Zre, Ang, Kil, Usb, Mad.)

**71. Frullania arecae** (Spreng.) Gott. Syn.: *F. ecklonii* (Spreng.) Gitt. et Lindenb. — Montane forests, subalpine *Philippia* heath. **Kil**: Marangu route 1500—1800m, ct (6363/B, D) det. VB, J; upper Kikafu 1600—1800m, ct (6346/FB) det. J; Nkweseko 1700—1800m, ct (6358 A) det. J; Umbwe route 1900—2100m, te (6352 Q) det. J. **Por**: Lake Ngozi crater rim 2200m, ct (6329/C) d. VB. (Tropical America, Zre, Bur, Uga, T, K, Cape, Nat, in tropical Asia: from Himalaya to Indonesia.)

**72. Frullania borgenii** Pears. — Montane forests. and subalpine *Philippia* heath. **Mer**: Malama 1800m, ct (6338/A) det. VB. **Kil**: NW from Shira, above Wasendo glade, 2700m, ct (6354 A) det. VB. **WUs**: Near Misalai along the Soni — Bumbuli road, 1500m, ct (6369/Q) det. VB. **Ulu**: Morningside 1240m, ct (6311/A) det. VB. **Uzu**: Kitonga gorge, 980m, ra (6317/B) det. VB. (Cape, Nat, Tvl, Rho, Swz, Moz, Ang, Zre, Z.)

**73. Frullania caffraria** Steph. Syn.: *F. hoehneliana* Steph. — Montane forest and subalpine *Philippia* heath. **Kil**: Upper Kikafu 1600—1800m, ct (6346/FA) det. J, VB; NW edge of Shira plateau above Wasendo glade, 2700m, ct (6354 B) det. VB. **WUs**: U. F. R. 1600—1880m, ct (6371/AA, 6373/B) det. VB. (Eth, Eritrea, Ruw, Elg, Ken and other places in K, Kil, Usb, Zre, Z, Nat, Cape, Mad.)

**74. Frullania diptera** Lehm. et Lindenb. — Submontane rain forest. **EUs**: Amani, Hunga v. 800m, ra (6378/R) det. J. (Zre, Tvl, Nat, Cape.)

**75. Frullania cambouena** Steph. — Lowland rain forest. **Ulu**: Kimboza F. R. 300m, ra (6301/A) det. VB. (Mad.)

**76. Frullania rehmannii** Steph. — Submontane rain forest and montane ericaceous heath. — **WUs**: U. F. R. 1500m, ct (6370 A) det. VB; near the Kambo waterfalls N of Mazumbai 1650m, Er (6374/BB) det. VB. **EUs**: Amani, Forest House 950m, ct (6376/B), det. VB; Hunga v. 860m, ra (6378/J) det. VB. (Cape, Rho, Moz.)

**77. Frullania serrata** Gott. — Montane and subalpine forests. **Kas**: upper slopes of summit peak, 1600—1640m, ph, coll. F. s. n., det. P. **Kil**: Marangu route 2200m, Er (6365 T) det. P. **Ulu**: Bondwa top 2100m, ra (6052/AN) det. P. (Tropical Asia and Oceania. In Africa: Kivu, Kil, Usb, Rho, Tvl, Nat, Cape.)

**78. *Frullania squarrosa*** (Reinw., Bl. et Nees) Dum. — Lowland and montane forests, woodland. **Mer:** Malama 1800m, ct (6338/G) det. VB. **WUs:** Misalai 1500m, ct (6369/D) det. J; U. F. R. 1450m, ru (6374/AA) det. J. **SHI:** near Mufindi village 1900m, ct (6320/K) det. VB. **Por:** Ngozi Lake crater rim 2200m, ct (6329/Q) det. J. (Pantropical.)

**79. *Frullania trinervis*** (Lehm. et Lindenb.) Gott., Lindenb. et Nees — Montane forests, subalpine heath. **Mer:** E crater edge 2600m, ct (6341/O) det. VB. **WUs:** near Misalai along the Soni — Bumbuli road, 1500m, ct. (6369/R) det. VB. **Por:** lower Fishing Camp near songole, 2000m, ct. (6326/B) det. VB. (Cape, Nat, Z, S—Zre.)

**80. *Frullania truncatiloba*** Steph. — Montane forests, subalpine heath. **Mer:** Kitoto 2450—2600m, ct (6340/E) det. VB. **Kil:** Mawingo Estate below Mweka 1350m, ct (6350/B) det. VB; NW of Shira above Wasendo glade 2600—2700m, ct (6354 E, 6355 E) det. VB. (Gui, Bur 2200m.)

**81. *Cololejeunea adhaesiva*** (Mitt.) Schust. Syn.: *Leptocolea adhaesiva* (Mitt.) E. W. Jones — Lowland rain forest. **Usa:** Gologolo Mts., Mwanihana F. R. near Sanje falls, 300m, ph (6144 E) det. P. (Endemic species of Usagara Mts. related to *C. planissima* in SE Asia.)

**82. *Cololejeunea africana*** (Steph.) Schust. Syn.: *L. africana* (Steph.) E. W. Jones — Montane mossy forests. **Tai:** Mbololo hill 1440—1680m, ph, coll. F. (70/761) det. P. **Kas:** near the summit, 1600—1640m, ph, coll. F s. n., det. P. **Sag:** E 1400—1500m, ph, coll. F. s. n., det. P. **Emali hill:** 1525—1784m, ph coll. F (71/951/B) det. P. **Ulu:** Lupanga NW 1500—2000m, ph (6124/E, 6130/D) det. P. (S—T, Cam, T: EUs.)

**83. *Cololejeunea appressa*** (Evans) Ben. — Montane forest. **Kas:** near the summit 1600—1640m, ph, coll. F s. n., det. P. (Widespread in tropical SE Asia, disjunct in tropical America; and in Africa, where it is known only from Uganda, Bunyoro prov., Budongo Forest. See the distribution map of G rolle 1969:578.)

**84. *Cololejeunea auriculata*** (E. W. Jones) Schust. Syn.: *L. auriculata* E. W. Jones — Lowland rain forest. **Shi:** Makadara Forest, 380m, ph, coll. F s. n., det. P; Sheldrick's falls 150m, ph, coll. F. s. n., det. P. (Nig: Okomu F. R., Cam: Barombi Lake, new for East Africa.)

**85. *Cololejeunea bidentula*** (Steph.) E. W. Jones — Montane mossy forests. **Tai:** Mbololo hill 1700—1800m, ph, coll. F (71/1020/F) det. P. **Ulu:** Lupanga NW 1800—2000m, ph (6130 O) det. P (Known only by the type specimen from Mad, new for continental Africa.)

**86. *Cololejeunea bolombensis*** (Steph.) Vand. Bergh. Syn.: *L. bolombensis* (Steph.) E. W. Jones — Montane forests. **Tai:** Mbololo Hill, 1440—1680m, ph, coll. F (70 762) det. P. **Kas:** slopes of the summit, 1600—1640m, ph, coll. F s. n., det. P. **Sag:** E 1400—1500m, ph, coll. F. s. n., det. P. **Ulu:** Lupanga NW 1800—2000m, ph (6130 B) det. P.: a from with very broad, triapiculate lobules. (Gui, Nig, Cam, Zre, Bur, Uga.)

**87. *Cololejeunea cardiocarpa*** (Nees et Mont.) Schust. — Lowland and montane forests. **Tai:** Mbololo Hill, 1440—1680m, ph, coll. F (70/763) det. P. **Kas:** S 1150—1250m, ph, coll. F. s. n., det. P. **Emali Hills:** 1525—1784m, ph, coll. F (71/951/G) det. P. **Maungu Hills:** 900—1050m, ph, coll. F

(71/961/H) det. P. **Shi**: Makadara Forest 380m, ph, coll. F s. n., det. P. (Subtropical and tropical America, New Caledonia, in Africa: Zre, Uga, Bur, Cape, T: Amani, Rondo Plateau.)

**88. Cololejeunea cristata** (Steph.) Schuster — Montane forests. **Kas**: 1250—1640m, ph, coll. F s. n., det. P. **Sag**: E 1400—1500m, ph, coll. F s. n., det. P. **Emali Hill**: 1525—1784m, ph, coll. F (71/951/F) det. P. (New for East Africa, known from Mad.)

**88/A. C. cristata** var. **occidentalis** E. W. Jones — Lowland rain forest. **Shi**: Makadara Forest 380m, ph, coll. F s. n., det. P. (Known from Nigeria. The Kenya plant shows transition to *Cololejeunea subciliata* (Mitt.) Schust. where this taxon probably belongs.)

**89. Cololejeunea dentata** (E. W. Jones) Schust. Syn.: *L. dentata* E. W. Jones — Montane forests. **Kas**: Rukanga route, upper slopes of summit, 1600—1640m, ph, coll. F s. n., det. P. **Kan**: near the top, 1370m, ph. (6140/AC) det. P. (Cam. New for East Africa.)

**90. Cololejeunea distalopapillata** (E. W. Jones) Schust. Syn.: *L. distalopapillata* E. W. Jones — Submontane and montane forests. **Tai**: Mbololo Hill 1440—1680m, ph, coll. F (70/764) det. P. **Kas**: S 1150—1250m, ph, coll. F s. n., det. P. **Emali Hill** 1525—1784m, ph, coll. F (71/951, C) det. P. **Ulu**: Lupanga NW 1500m, ph (6124/F) det. P. (T: Amani, Kil, Kat, Bur.)

**91. Cololejeunea duvignaudii** E. W. Jones — Montane forest. **Tai**: Mbololo Hill 1700—1800m, ph, coll. F(71/1020/D, a fragment) det. P. (Zre, Gab, new for East Africa.)

**92. Cololejeunea elegans** Steph. — Submontane forest. **Kas**: E 1250—1400m, ph, coll. F s. n., det. P. (Cam, new for East Africa.)

**93. Cololejeunea cf. filicaulis** Steph. with perianths — Montane forest. **Ulu**: Lupanga NW 1800—2000m, ph (6130/N) det. P. (Known only from the type locality: Cameroons, Jonje.)

**94. Cololejeunea furcilobulata** (Berrie et E. W. Jones) Schust. — Lowland rain forest. **Ulu**: Kimboza F. R. 300m, ph (6054/P) det. P. (Nig: Ibadan)

**95. Cololejeunea grossidens** Steph. Syn.: *C. malanjae* Steph. — Montane forests. **Kas**: 1250—1600 m, coll. F. s. n., det. P. **Tai**: Mbololo Hill, 1440—1800m, coll. F (70/766) det. P. **Sag**: 1400—1500m, ph, coll. F (70/766) det. P. **Lug**: 1400—1500m, ph. coll. F (71/1020/K) det. P. **Emali Kill**: 1525—1784m, ph, coll. F (71 951/A) det. P. **Ulu**: Mwere v. 1400—1600m, ph (6156/B) det. P; Lupanga NW 1500—2000m, ph (6124/H, 6130 E) det. P. **Kan**: 1370m, ph (6140 AD) det. P. (Mal, T: Ulu, Bur.)

**96. Cololejeunea himalayensis** (Pande et Misra) Schust.—Lowland, submontane and montane forests, in drier woodland area riverine forests, usually on shady, moist rocks in stream beds, very seldom epiphyllous. Many of the collectings have strong papillose cuticle. Both the papillosity and the breadth of the hyaline margin shows a great variability. Broad margin and papillose cuticle seem to be correlated with lower, drier habitats, as at localities No. 6716, 6420, 6856, 6861, and 6745. The papilosity of cuticle is not mentioned by Pandé and Misra, Jones or Vanden Berghen. Even one of the first African gatherings pub-

lished by E. W. Jones from Nigeria (No. 903) has strong verruculose cuticle. **S Pare Mts.:** Mt. Kwizu E, near Kisiwani 1000m, ru (6716/N) det. P. **Kitulanghalo F. R.** NE of Morogoro 450—770m, ru, ph (6856 U, BE) det. P. **Ulu:** Morogoro, valley behind the Teachers' College, 700m, ru P s. n., Bahati Camp 600m, ru (6561/K) det. P; Gambaula F. R. 5 km NE of Tawa village, 450m, ru (6420/G) det. P; Kinole, Midhani, Mzuazi stream, 845m, ru (6882/E) det. P. **Uka:** Msowero stream 600m, ru (6745/A) det. P. **Por:** Lugombo village SW of Tukuyu town, 1225m, ru (6768/C) det. P. (West Himalaya 1350—1800m, South China: Hainan, Fukien, In Africa: Nig, Uga, Bur, Shaba, Mal, T: Mtibwa F. R., Kimboza F. R., Morogoro river valley, 300—1250m.)

**97. Cololejeunea leloutrei** (E. W. Jones) Schust. Syn.: *Leptocolea leloutrei* E. W. Jones — Lowland and montane rain forests. **Tai:** Mbololo Hill 1440—1800m, ph, coll. F (70/767, 71/1020 A) det. P. **Kas:** slope of summit 1150—1640m, ph, coll. F. s. n., det. P. **Ulu:** Kimboza F. R. 300m, ph (6216/B) det. P; Tumbako SE 1000m, ph 6168/A det. P; Mwere v. 1400—1600m, ph (6156 A) det. P; Lupanga NW 1800—2000m, ph (6130/G) det. P. (S—T, Mad, Mau, New for continental Africa. Some specimens, as e. g. 6130/C have lobules with 3 teeth, showing affinity to the Asian *Leptocolea triapiculata* Herz.)

**98. Cololejeunea peraffinis** Schiffn. cum var. *elegans* Ben. — Montane mossy forest. **Ulu:** Lupanga 1800—2000m, ph (6130 Q) det. P. (Widespread in tropical Asia. In Africa only: Guinea, Massif de Ziama, 950m.)

**99. Cololejeunea punctata** (E. W. Jones) Schust. Syn.: *Leptocolea punctata* E. W. Jones — Dry evergreen mist forest. **K:** Maungu Hills S of Maungu, 900—1050m, ph, coll. F (71/961/E) det. P. (Known only from the type locality EUs: Amani.)

**100. Cololejeunea pusilla** Steph. var. *obtusifolia* E. W. Jones — Lowland rain forest. — **Shi:** Makadara Forest 380m, ph, coll. F s. n., det. P. **Usa:** Mt. Gologolo, Mwanihana F. R. near Sanje falls, 300m, ph (6144 F) det. P. **Ulu:** Kimboza F. R. 300m, ph (6216 C, 6236 B, 6273/C) det. P. (Gui, Côte-d'Ivoire, Nig, Cam, Gab, Zre, Bur, T.)

**101. Cololejeunea zenkerii** (Steph.) E. W. Jones vel sp. aff. — Montane mossy forest. **WUs:** U. F. R. 1855m, ph (6372/CM) det. J. (Gui, Cam, Bur.)

**102. Cololejeunea xaverii** (Lac.) E. W. Jones — **Kas:** Rukanga route, E 1250—1640m, ph, coll. F. s. n., det. P (New for continental Africa: known only from Mad.)

**103. Diplasiolejeunea albifolia** (Tayl.) E. W. Jones — Submontane and montane forests. **Tai:** Mbololo hill 1440—1800m, ph coll. F (70/768, 71/1020/B) det. P. **Kan:** S slope of the mean peak 1370m, ph (6140 AA) det. P. **Ulu:** Lupanga NW 1400—2000m, ph (6130/F, 6124/G) det. P, revid. G. (Nig: Owerri; Mau. New for EAf.)

**104. Diplasiolejeunea cavifolia** Steph. Syn.: *D. brachyclada* Evans, *D. vandenberghenii* Grolle — Submontane rain forest. **K:** Maungu hills S of Maungu, 900—1050 m, ph coll. F 71/961/D det. P **EUs:** Amani 900m, ph on *Encephalartos* leaves (6097 J, 6381/AA) det. J. (Puerto Rico, Ja-

maica, Trinidad, Brasil, Java, Sumatra. In Africa: S—T, Ghana, Nig, EUs.)

**105. *Diplasiolejeunea cornuta*** Steph. Montane forest. **Kas:** E slope of the summit 1600—1650m, ph, coll. F s.n., det. P (Kil, WUs, EUs, Ulu, Réu.)

**106. *Diplasiolejeunea runssorensis*** Steph. — Montane mossy forest. **Tai:** Mbololo hill 1700—1800m, very rare ph, coll. F (71/1020/AA) det. P. **Ulu:** Lupanga NW 1800m, ph on *Elaphoglossum* (6130 L) det. P. (Ruw: 3300m, Kivu: 3100, Rwa: 1950m, Mad.)

**107. *Diplasiolejeunea symoensii*** Vand. Berg. Syn.: *Leptolejeunea degelii*. S. Arnell — Submontane and montane forests. **Kas:** Rukanga route E 1259—1400 m; ph, coll. F s. n., det. P. (Rwa, Kivu, Bur.)

**108. *Diplasiolejeunea utriculata*** Steph. — Montane forest. **Tai:** Mbololo hill 1440—1800m, ph, coll. F (70/769, 71/1020 G) det. G. (New to continental Africa, previously know only from Madagascar.)

**109. *Lopholejeunea kilimanjarica*** E. W. Jones — Lowland riverine forest. **Usa:** Kilombero Scarp. F. R., 300m, ct (6144 N) det. J. (Kil. Z.)

**110. *Lopholejeunea laciniata*** E. W. Jones — Submontane and montane forests. **WUs:** Misalai 1500m, ct 63/S det. J. **Ulu:** Morningside 1240m, ct (1311/C) det. J. (Know only from Kil.)

**111. *Caudalejeunea africana*** (Steph.) Steph. — Lowland and montane forests. **Kas:** E 1400—1600m, ph, coll. F s. n., det. P. **Ulu:** Kimboza F. R. 250—300m ph (6216/E, 6236/A) det. P, revid. J. (Nig, Zre.)

**112. *Caudalejeunea hanningtonii*** (Mitt.) Schiffn. — Lowland and montane forests. **K:** **Emali Hill** 1525—1784m, ph, coll. F s. n., det. P; **Maungu Hills** S of Maungu, 900—1050m, ph, coll. F (71/961) det. P; **Sag:** E 1400—1500m, ph, coll. F s. n., det. P; **Kas:** summit 1600—1640m, ph, coll. F s. n., det. P. **Shi:** Makadara Forest 380m, ph, coll. F s. n., det. P. (Nig, Cam, Zre, Usa.)

**113. *Ptychocoleus mollerii*** (Steph.) Steph. — Montane forests. **Kil:** Mawingo Estate below Mweka 1350m, ct (6349/N) det. J; near Maua between Marangu and Old Moshi 1750m, ct (6368 O) det. J. **WUs:** near Misalai 1500m, ct (6369/FA) det. J; U. F. R. 1500m, ct (6370/AD) det. J. **Ulu:** Morningside 1240m, ct (6311/B) det. J. (Gui, S—T, Nig, Gab, Zre, Z, Usb, Nat.)

**114. *Ptychocoleus pappeanus*** (Nees) Steph. — Submontane and montane forests. **WUs:** U. F. R. 1500—1750m, ct, ra (6374/B, 6371 AA) det. J; Misali 1500m, ct (6369/FB) det. J. **EUs:** Amani, ct (6100/T) det. J. **Ulu:** Lupanga 1700—1800m, ru (6127/A) det.. J. (F—P, S—T, Cam, Uga, Mal, Rho, Cape.)

**115. *Marchesinia moelleriana*** Pearson — Montane forest, subalpine elfin woodland. **Kas:** slope of the main summit 1400—1600m, ph, coll. F. s. n., det. P. **WUs:** U. F. R. 1600—1880m, ra (6371 A, 6372 W) det. J. **Ulu:** Bondwa top 2120m, ct (6309/R) det. J. **SHI:** on planted *Cupressus* near Mufindi village 1900m, (6320 M) det. J. **Por:** Ngozi Lake crater rim 2200m, ct (6329/B) det. J. (Elg, Mal: Zomba Mt., Ndirande, Rho: Umtali, 1460—1830m.)

**116. Mastigolejeunea carinata** (Steph.) Steph. — Submontane forest, *Brachystegia* woodland. **Usa:** SW of Mikumi village, 900m, ct (6312/A) det. J. **EUs:** Sigi 490m, ct 6383/A det. J. (Gui, Senegal, Nig, RCA, Sudan, Zre, Cam, S—T, Kil, Rho, Usa, Usb, Rod.)

**117. Mastigolejeunea rhodesica** (Vand. Bergh.) E. W. Jones — Riverine forest. **Z:** Victoria Falls, Palm Grove 800m, ru (6614/B, D) det. J. (Victoria Falls, Nat, T: Rondo Plateau.)

**118. Brachiolejeunea tristis** Steph. — Solitary trees in gardens, roadsides. **Kil:** Mweka Wildlife College garden, 1400m, ct, coll. et det: J; Ghona v. near Makom, W of Marangu, 1400m, on planted Cupressus bark (6366/D) det. J. (Cam, Bur, Eth, Kil.)

**119 Archilejeunea abbreviata** (Mitt.) Vand. Bergh. — Submontane forest. **EUs:** Amani, near Forest House 920m, ct (6377/B) det. J. (Gui, Nig, Cam, Gab, Ang.)

**120. Leucolejeunea xanthocarpa** (Lehm. et Lindenb.) Evans Syn.: *L. capensis* S. Arnell. — Montane forest and subalpine ericaceous heath. **Kas:** E: 1250—1400m, ph, coll. F. s. n., det. P. **Mer:** E 2000—2650m, ct (6339/G, 6340/E) det. J. **Kil:** Maua between Marangu and Old Moshi, 1750m, ct (6368/L) det. J; Marangu route 1900—2200m, ct (6364 B) det. J. **SHI:** Mufindi Scarp F. R. near Fishing Camp 1730m, ct (6322 A) det. J. **Ulu:** Midhani above Kinole village, 880m, ra (6881/AJ) det. P. (Widespread in tropical America and Asia — see map of Verdoorn 1934. In Africa: Kivu, Ken, SAF, Mad.)

**121. Leucolejeunea unciloba** (Lindenb.) Evans — Montane forest, roadside trees. **WUs:** U. F. R. 1600m, ct (6371/D) det. J; Bumbuli — Soni road near Misalai 1500m, ct (6369/T) det. J. (Trop. & subtrop. America, Cape, T.)

**122. Odontolejeunea tortuosa** (Lehm. et Lindenb.) Steph. — Submontane forest and woodland, montane forest. **Tai:** Mbololo hill 1440—1800m, ph, coll. F (70/771, 71/1020/H) det. P. **Kas:** 1250—1640m, ph, coll. F. Maungu Hills S of Maungu, 900—1050m, ph. coll. F (71 961/A). **Ulu:** Mt. Mindu 1240m, ct, ph. (6843/P) det. P. Mwere v. 1400—1600m, ph (6156 C) det. P. Lupanga 1800—2000m, ph. (6130 T) det. P. (Gui, Cam, S—T, Zre, Bur, Usg.)

**123. Prionolejeunea serrula** Mitt. Syn.: *P. kindbergii* Steph. — Submontane rain forest. **Ulu:** Mwere v. 1400—1600m, ph, mu (6158 AL) det. P. (S—T, Principe Isl., Ann, Cam, Gab, Nig, Zre.)

**124. Dicranolejeunea madagascariensis** Steph. — Montane mossy forest. **Kil:** Marangu route 1900—2200m, ct (6364/E) det. J. — var **obtusifolia** E. W. Jones — Riverine forest. **Z:** Victoria Falls, Palm Grove, 800m, ru (6614/N, L) det. J. (Cam, Elg, EUs: Amani, Mad.)

**125. Ptychanthus striatus** (Lehm. et Lindenb.) Nees 1838, Naturgesch. Europ. Leberm. 3:212; *Jungermannia striata* Lehm. et Lindenb 1832 Pugillus 4:16; Syn.: nov.: *Ptychnathus dioicus* (Sim.) S. Arnell 1953, Botan. Notiser 106: 185. — Already Verdoorn synonymized *Ptycholejeunea dioica* Sim with *P. striatus* (De Frullaniaceis XV, 1934: 116) and stated that dioicous specimens are not rare within *Ptychanthus striatus*. Such

specimens are common even in Tanzania, especially vigorous males. — Submontane and montane forests. **Ken:** Castle Forest Station 2000m, ct (6603 D) det. P. **Mer:** Ngurdoto crater rim 1800m, ct (6213 C) det. P. **Kil:** Mweka route 1800—1960m, ct (6211 E); Maua between Marangu and Old Moshi 1700m, ct (6368 R); Umbwe route 1806—1900m, ct (6211 E) det. P. **WUs:** U. F. R. 1800m, ct (6372/U) det. P. **Ulu:** Mt. Tumbako 1000m, ct (6167'/AB) det. P. Mwere v. 1500—1600m, ru, ct (6157/D, 6158 V, 6220 H) det. P. Bondwa N 1700—2050m, ct (6012/AI, AX, 6230/H). **Kib:** ont the top 1900—2000m, ct (6569/K) det. P. **Shi:** Mufindi Scarp F. R. near the Fishing Camp 1730m, ct (6322/G) det. J; Lupeme Estate 1750m, ct (6318 M) det. P. **Por:** Isongole — Lake Ngozi 2000m, ct (6331 F) det. P. **Mul:** Likabula v. 900—1600m, ct coll. R (11759—60) det. P. (Widespread in tropical and subtropical Asia, Australia, Oceania and Africa. In T: Bukoba, Usb.)

**126. *Leptolejeunea epiphylla* (Mitt.) Steph. Spec.: Hepat. V (1913): 380. *Lejeunea epiphylla* Mitt., Proc. Linn. Soc. (1861): 118. Syn. nov.: *Leptolejeunea quintasii* Steph. var. *mascarenica* S. Arnell, Svensk Bot. Tid. 59 (1965): 77. Comparing the type specimens of S. Arnell with Asian *L. epiphylla* and the descriptions of Herzog (Flora 135, 1942:413), I found *L. quintasii* var. *mascarenica* conspecific with the Asian *Leptolejeunea epiphylla*, partly with its *f. angusta* Herz. Although the var. *mascarenica* was not validly published, Arnell's description drew my attention to the possibility of the identity of these taxa and a Kenyan specimen collected by A. and R. Faden. — Lowland rain forest. **Shi:** Makadara Forest 380m, ph coll. R. B. Faden A. Evans and A. S. Mahasi s. n., 7. Nov. 1970. det. P. (New to Africa. Mauritius: Le Pouce and Macabé, coll. S. Arnell as *L. quintasii* var. *mascarenica*. Widespread in tropical Asia and Oceania.)**

**127. *Leptolejeunea quintasii* Steph. —** Mainly in lowland and in submontane rain forests. **Shi:** Makadara forest, 380m, ph, coll. F s. n., det. P., Sheldrick's Falls, 150m, ph, coll. F s. n. det. P. **Kas:** 1150—1640m, ph, coll. F s. n., several specimens, det. P. **EUs:** Amani 900m, ph (6088/B) det. P. **Ulu:** Kimboza F. R. 250—300m, ph (6216 D, 6236/G, 6273/B) det. P. (Cote d'Ivoire, S—T, Zre, T.)

**128. *Leptolejeunea thoméensis* (Steph.) Steph. Syn.: *L. truncatiloba* Steph. —** Lowland and montane rain forests. **Kas:** 1150—160m, ph, coll. F s. n., det. P. **Shi:** Makadara Forest 380m, ph, coll. F s. n., det. P. Maungu Hills S of Maungu, 900—1050m, ph, coll. F (71/961/C) det. P. **Tai:** Mbololo Hill 1700—1800m, ph, coll. F (71/1020/J) det. P. **EUs:** Amani 900m, (6088/A) det. P. **Ulu:** Mwere v. above Morogoro, 1400—1600m, ph (6156 D) det. P. (Gui, S—T, Togo, Cam, Gab, Rwa, Bur, EUs.)

**129. *Drepanolejeunea cultrella* (Mitt.) Steph. —** Montane forests. **Tai:** Mbololo Hill 1440—1800m, ph, coll. F (70/759, 71/1020/F) det. P. **Ulu:** Lupanga NW 1800—2000m, ph (6130/J) det. G. **Sag:** E 1400—1500m, ph, coll. F s. n., det. P. (Gui, S—T, Cam, Rwa, Bur, Ulu.)

**130. *Drepanolejeunea friesii* Vand. Bergh. —** Montane mossy forest, subalpine elfin and *Erica* forests. **Kas:** 1400—1600m, ph, coll. F s. n., det. P. **Tai:** Mbololo Hill 1700—1800m, ph, coll. F (71/1020/Y) det. P. **Kil:** Ma-

rangu route towards Mandara hut, 2200—2650m, Er (6240/0, 6365/U, K) det. P; above Nkweseko, 1800m, li (6359 E) det. P. (Rwa, Ruw, Kivu, Rwa, Ken, Kil.)

**131. Drepanolejeunea cambouena** Steph. — Elfin woodland with *Syzygium* — *Allanblackia* — *Philippia* and thick acanthaceous undergrowth. **Ulu:** Bondwa peak, 2100m, ph, on *Lobelia lukwangulensis* leaves. Coll. M (1140), det. G. (Mad, Mau, new for continental Africa.)

**132. Ceratolejeunea jungneri** Steph. — Submontane rain forest. **EUs:** Amani 900m, ph (6318/A, ? 6100/T) det. J. (Cam, Gab, Zre, Usb.)

**133. Taxilejeunea conformis** (Mont.) Steph. — Montane forest. **Kas:** E 1400—1600m, ph, coll. F s. n., det. P. **Ken:** Castle forest St. 2300m, ph, coll. F s. n., det. P. (Cam, Zre, Bur, Uga, Usb, Mal, Cape, Mad, Réu, Mau.)

**134. Cheilolejeunea newtonii** Steph. — Subalpine bamboo thicket. **Ken:** Kamweti Forest Station, 2600m, Ba (6601/D) det. P. (Principe, Ghana, S—L, Gui, Zre — nem East Africa.)

**135. Cheilolejeunea principensis** Steph. — Submontane rain forest. **EUs:** Amani, 950m, ct (6100/BA) det. J. (S—L, Nig, Cam, F—P, Principe, Mad. New for East Africa.)

**136. Cheilolejeunea silvestris** (Gott.) E. W. Jones var. *silvestris* Syn.: *Pycnolejeunea silvestris* (Gott.) Steph. — Submontane and montane forests, mist effected *Brachystegia* woodland. **Kas:** 1150—1600m, ph, coll. F. s. n., det. P. **Tai:** Mbololo hill 1700—1800m ph, coll. T F (71/1020/AB) det. P. **WUs:** U. F. R., Kambo falls, 1600m, ct (6374 A) det. J. **EUs:** Amani Forest House 950m, ra (6376/A, 6377/B) det. J; Hunga v. 860m, ra (6378 A) det. J. **Ulu:** Mt. Mindu 1240m, ct, mu, ph (6843/Q) det. P; Kinole sawmill 900m, ct (6172 B) det. P. **Kan:** 1370m, ph (6140/AN) det. J. (Mad, Réu, Mau, WUs, EUs, Kan, Ulu.)

**137. Cheilolejeunea silvestris** var. *involuta* (Steph.) E. W. Jones Syn.: *Pycnolejeunea involuta* Steph., *Ch. africana* E. W. Jones — Lowland and submontane rain forest. **K:** Maungu hills 900—1050m, ph, coll. F. (71/961/K) fragm., det. P. **Ulu:** Kimboza F. R. 300m, ph (6216/F, 6236/H) det. P. (Ghana, Nig, Cam, Uga, Usb, Ulu.)

**138. Microlejeunea africana** Steph. Syn.: *Lejeunea ulicina* (Tayl.) Tayl. ex Gott. ssp. *ocellifera* (S. Arnell) Schust, *L. ulicina* ssp. *africana* (Steph.) Vand. Bergh. — Lowland and montane forests. **Tai:** Mbololo Hill 1440—1800m, ph, coll. F (71/1020/E, 70/770) det. P. **Kas:** E 1150—1600m, ph, coll. F. s. n., det. P. **Sag:** E 1400—1500m, ph, coll. F s. n., det. P. **Emali Hill** 1525—1784m, ph, coll F (71/951/D) det. P. **Maungu Hills** 900—1050m, ph, coll. F (71/961/F) det. P. **Shi:** Makadara Forest 380m, ph, coll. F. s. n., det. P. **Kan:** 1370m, ph (6140/AG) det. P. **Ulu:** Lupanga 1800—2000m, ph (6130 U) det. P. (Dahomei, Cam, Nig, S—L, Principe, Zre, Rwa, Bur, Uga, K, Usb, Moz, Rho, Tvl, Nat, Cape, Mad.)

**139. Microlejeunea kamerunensis** Steph. — Submontane and montane forests. **Kas:** E 1250—1600m, ph, coll. F s. n., det. P. **Sag:** E 1400—1500m, ph, coll. F s. n., det. P. **Ulu:** Lupanga NW 1800—2000m, ph (6130 X) det. P. (Cam, S—T, Bur, Kil.)



**140. *Lejeunea acuta*** Mitt. Syn.: *Hygrolejeunea acuta* (Mitt.) Vand. Bergh., *Nesolejeunea intercalaris* Herz. — Submontane and montane forests. **Kas:** E 1250—1600m, ph, coll. F s. n., det. P. **Ulu:** Bondwa 1950—2080m, ra (6051/BS) det. J. (F—P, S—T, Ann, Cam, Kivu, Rwa, Comores.)

**141. *Lejeunea arnelliana*** (S. Arnell) Schust. Syn.: *Ciliolajeunea capensis* S. Arnell. — Montane forest. **Ulu:** Lupanga NW 1500m, ct (6123/BA) det. J. (Cape: Knysna, River Zonder Eide. New for East Africa.)

**142. *Lejeunea caespitosa*** Lindenb. — Submontane and montane forests. **Kas:** 1400—1600m, ph, coll. F s. n., det. P. **Sag:** 1400—1500m, ph, coll. F s. n., det. P. **WUs:** U. F. R. 1500—1850m, ph (6372 CO) det. J. **EUs:** Amani 1000m (6068/F) det. J; Sigi v. 490 m, ct (6383/D) det. J. (Probably pantropical.)

**143. *Lejeunea eckloniana*** Lindenb. — Lowland and montane forests. **Ulu:** Mwere v. 1500m, Cy (6158/D) det. J; Morningside 1700m, ru (6048/K) det. J. **Z:** Victoria Falls, Palm Grove, 800m, ru (6614 H, J, F, M) det. J. (Canaries, Cap Verde Isls., tropical and South Africa widespread.)

**144. *Lejeunea flava*** Sw. ssp. *tabularis* (Spreng.) S. Arnell — Submontane and montane forests. **Kas:** E 1250—1600m, ph, coll. F s. n., det. P. **Tai:** Mbololo Hill, 1700—1800m, ph, coll. F (71/1020/R) det. P. **WUs:** U. F. R. 1850m, ph (6372 CN) det. J. **EUs:** Amani 950m, ct (6086/A) det. J. **Ulu:** Lupanga 1300—2000m, ph (6124/D, 6130/V) det. J. (The species is pantropical. The ssp.: F—P, Nig, Cam, Gab, Principe, Congo, Zre, Bur, Uga, K, T, Saf.)

**145. *Lejeunea grossecristata*** (Steph.) E. W. Jones — Lowland rain forest. **Shi:** Makadara Forest, 380m, ph, coll. F s. n., det. P. (S—T, Nig, Cam, Uga, Kivu, Abe.)

**146. *Lejeunea isophylla*** E. W. Jones — Montane and subalpine forests. **Kas:** E 1600—1640m, ph, coll. F s. n., det. P. **Sag:** 1400—1600m, coll. F s. n., det. P. **Ulu:** Bondwa top 1950m, ra (6051/BT) det. J; Lupanga crest 1800—2100m, ph, ra (6130/W, 6133/A) det. J. (Cam, Zre: Kivu, Muh, Abe, Kil, Usb, Mal, Comores, Mad.)

**147. *Lejeunea kamerunensis*** Steph. — Lowland and montane forests. **EUs:** Amani 100m, ct (6102/E) det. J. **Ulu:** Lupanga 1500m, ct (6123/BA) det. P. **Usa:** riverine forest near Kidatu, 300m, ct (6144 M) det. J. (Cam, Nig, S—L, Usb, Mal.)

**148. *Lejeunea letabaensis*** S. Arnell — Lowland and montane forests. **Mer:** Malama 1800m, ct (6338/M, B) det. J. **Kil:** Weru Weru v. near Kissereni, 1260m, ct (6345/A) det. J; Mawingo Estate near Mweka 1350m, ct (6350/K) det. J. **WUs:** U. F. R. 1600m, on *Dracaena* bark (6371 C) det. J. **Ulu:** Lupanga 1500m, ct (6123/A) det. J. **Z:** Victoria Falls, Palm Grove 800m, ru (6614/GA, O) det. J. (SE Zre, Ang, Tvl, Rho.)

**149. *Lejeunea longirostris*** (Steph.) E. W. Jones — Submontane rain forest. **Kas:** E 1400—1600m, ph, coll. F. s. n., det. P. **EUs:** Amani 950m, ct (6100 B) det. J. (S—T, Cam. New for East Africa.)

**150. *Lejeunea* cf. *setacea*** Steph. Syn.: *Stylolejeunea setacea* (Steph.) S. Arnell, — Submontane forest. **Kas:** S 1150—1250m, ph coll. F s. n., det. P. A reduced form with undeveloped setiform lobulae reminding to

*L. microlobulata* S. Arnell, which may belong here. The species is closely allied to the American *L. pililoba* Spruce. (S—L, Nig, Cam, Congo, Zre, S—T, Principe, Bur.)

**151. *Euosmolejeunea brachytoma*** (Gott.) Steph. — Submontane rain forest. **EUs:** Amani, 900—1000m, ct (6102 E, 6381 B) det. J. (Usb, Ghana, Gab, Mad, Mau.)

**152. *Euosmolejeunea grandistipula*** (Steph.) Steph. — Mist effected woodland. **Ulu:** Mt. Mindu 1200m, ct (6152/AB) det. J (S—T, S—L, new for East Africa.)

**153. *Euosmolejeunea montagnei*** (Gott.) Steph. — Montane forest and ericaceous heath. **Kas:** E 1400—1600m, ph coll. F s. n., det. P. **WUs:** U. F. R. 1800—1880m, Er (6373/A, C) det. J. (S—T, Rwa, Mad, Réu.)

**154 *Metzgeria elliotii*** Steph. Syn.: *M. latifrons* Steph. — Montane and subalpine forests. **Uka:** Ikwamba 1800m, ct, coll. M (1479) det. P; Mnyera ridge 2100m, ra (6871 O) det. P. (Ruw, Rwa, Ken, Zre: Kivu, Edward Lake area, Mt. Kahuzi, Muh, Elg, Abe, Cape, Nat, Ceylon.)

**155. *Metzgeria hamata*** Lindb. — Montane and subalpine forests. **Kil:** Umbwe route 1900—2900m, ct, ru (6191 Q, 6788 AC) det. P. **Ngu:** Mafulumula saddle above Mnembule village, 1650—1800m, ct (6438/S) det. P. **Ulu:** Palata — Kinazi ridge 1850m, ct (6852/X) det. P. Bondwa 1800—2120m, ct, ra (6574/D, 6051 BG, 6052/Q, 6261/G, 6404/AC, 6232/G) det. P; Mt. Tumbako SE 1000m, ct (6167/V) det. P. **Uka:** Ikwamba N, 1900m, ra (6866/G) det. P. **Mul:** Likabula v. 900—1600m, coll. R (11736, 11753) det. P. (Oceanic cosmopolite, in Africa: Canary and Açores Isls., S—T, Ruw, Zre: Kivu area, Kar, Muh, Rho: Inyanga.)

**156. *Metzgeria hedbergii*** Vand. Bergh. — Subalpine bamboo thickets. **Ken:** Above Kamweti Forest Station 2500m, Ba (6601 A) det. P. Very typical, with gemmae. (Ruw, Muh, Elg, Ken.)

**157. *Metzgeria limbato-setosa*** Steph. — Montane and subalpine forests. **Ken:** Castle Forest Station 1960—2000m, ct (6603 E) det. P. **Kil:** Maua between Marangu and Old Moshi 1750m, ct (6368/J) det. P. **Kib:** On the top 1900—2000m, ct (6569/L) det. P. **Uka:** Mnyera ridge 1900—2100m, ct (6739/D) det. P. **Ulu:** Lupanga 1840—2140m, ct, ra (6130/AE, 6070/U) det. P; Lupanga — Kinazi ridge 1800—1900m, ra (6836/AR) det. P. Bondwa N 1700—2130m, ct, ra (6012/I, AB, AH, 6230 I, 6052/AJ, 6309/S) det. P. Bondwa SW 200—2100m, ct (6261/M) det. P. **SHI:** Lupeme Estate near Mufindi 1750—1800m, ct (6318/N) det. P. **Run:** Mt. Rungwe SW 2100—2300m, ct (6764/X) det. P. **Kip:** Kitulo plateau 2635—2685m, ct (6750/X) det. P. (Rwa, S and E Zre, Eth, Rho, Moz, Nat, Tvl, Zul.)

**158. *Metzgeria madagassa*** Steph. — Montane forests. **Sag:** E 1400—1500m, ph, coll. F s. n., det P. **Tai:** Mbololo Hill 1700—1800m, ph, coll. F (71/1020/Q) det. P. (Usb, Nat, Cape, Mad, Mas, Sikkim Himalaya.)

**159. *Metzgeria propagulifera*** Vand. Bergh. — Montane and subalpine forests. **Uka:** Mandege Forest Station 1570m, ra (6860/G) det. P. **Kip:** Kitulo Plateau E of Igoma 2675m, ra (6750/AK) det. P. (Zre: Lake Albert District near Nioka. A very isolated and characteristic species.)

**160. Metzgeria tabularis** Steph. — Montane mossy forest. **Ulu:** Lupanga SW 1800m, ct (6285/BN) det. P; Bondwa NE 1740m, ct (6578 AQ) det. P. (Cape. New for tropical Africa.)

**161. Metzgeria thoméensis** Steph. Syn.: *M. camerunensis* Steph. — Montane forests. **Kas:** E 1250—1600m, coll. F several samples s. n., det. P. **WUs:** U. F. R. 1750—1880m, ru (6372 AJ) det. P. **Uka:** Mt. Kifigo above Uponela village 1760—1825m, ct (6592/H) det. P; N of Mandege Forest Station 1540m, ru (6737/L) det. P; Mt. Ikwamba N 1920m, ct (6866 V) det. P. **Ulu:** Bondwa NW, N 1400—1900m, ct, Cy (6006/N, 6030 G, 6012/V, 6185/N) det. P; Bondwa SE 200—2100m, ct (6261/L) det. P; Manga E 1100m, ra (6263/D) det. P. Lupanga NW 1800—2000m, ru (6129 C) det. P; Lupanga — Kinazi ridge 1800—1900m, ct (6836/BA) det. P; Kinazi NW, N 1400—1900m, ct, ru (6289 AD, 6837/C) det. P; Mwere v. 1400—1620m, ct (6158 P, AK, 6534/N, 6258/B) det. P; Msanga Falls 1150m, ra (6110/V) det. P; Magari peak 1500—1800m, ru (6296/Q) det. P. (S—T, Ann, Nig, Cam, Zre: Kivu, Ruw, Ken.)

**162. Metzgeria violacea** (Ach.) Dum. (1805). Syn. nov.: *Metzgeria convexa* Vand. Bergh. Svensk Bot. Tidskrift 45 (1951): 362—363. There are thallus ends among the branches of typical *M. violacea* specimens, which are not tapering and do not have any coloration, showing typical *M. convexa* characters. Near the type locality of *M. convexa* one can find all transitions between *M. violacea* like and *M. convexa* like thalli. The latter seems to be only an ecological modification of *M. violacea* in the subalpine region of Mt. Kenya — Montane forests, subalpine elfin forest, bamboo thickets and *Philippia* heath. **Ken:** Above Kamweti Forest Station, 2500—300m, Ba (6601/B) det. P. **Kas:** E 1400—1600m, ph, coll. F s. n., det. P. **Sag:** E 1400—1500m, ph, coll. F s. n., det. P. **Kil:** Mweka route 2500m, ra (6717 F) det. P; NW end of Shira Plateau above Wasendo Glade, 2600—2700m, ct, Er (6354/D, 6355/B) det. P. **Uka:** Mandege Forest Station 1570m, ra (6860 J) det. P. **Ulu:** Bondwa NE 1940m, ra (6845 H) det. P. **Kib:** Summit 2000m, ra (6569/M) det. P. (S America, New Zeland, Tasmania, Africa: Cape, Nat, Tvl, Lake, Albert, Lake Edward, Kar, Bur, Ruw, Ken.)

**163. Pallavicinia Iyellii** (Hook.) S. F. Gray Syn.: *P. pilifera* Steph. — Montane forests. **Kil:** Marangu route near Mandara Hut, 2700m, te (6244 B) det. P. **Ulu:** Bondwa N 1700m, te (6011 K) det. P. (Oceanic subcosmopolite. In Africa: Cape, Nat, Shaba, Rwa, S—T.)

**164. Symphogyna podophylla** (Thunb.) Nees et Mont. — Montane mossy forest and subalpine moorland. **Ken:** Naro Moru track, *Sphagnum* bog at 3300m, coll. A (344) det. P; Sirimon track 3500m, streamside bank, coll. A (68) det. P. **Abe:** Charia river, te, coll. A (338) det. P. **Kil:** Marangu route above Mandara hut, 2700m, ru (6244/A) det. P. (Southern part of South America, TdC, Eth, Ruw, Kil, Kar, Muh, Elg, Ken, Rho, Nat, Tvl, Cape.)

**165. Symphogyna harveyana** Tayl. — Montane mossy forest, subalpine moorland. **Ken:** Naro Moru track 345m, coll. A (347) det. P. **Kil:** Marangu route, near Mandara hut, 2700m, ru (6244/C) det. P. (Ruw, Muh, Cape.)

**166. *Riccardia fastigiata*** (Lehm.) Trev. Syn.: *R. longispica* (Steph.) E. W. Jones — Montane forest. **Abe:** Queen's waterfall, ru, coll. A (136 A) det. P. **Ulu:** Bondwa N 1600—1800m, te, ru (6011/U, 6050/NO) det. P. (SE Zre, Eth, Z.)

**167. *Riccardia holstii*** Steph. E. W. Jones — Montane forest. **Ulu:** Bondwa N 1800m, te (6011/S) det. P. (E—Zre: Albert Park, Ruw, Usb, Ulu.)

**168. *Riccardia limbata*** (Steph.) E. W. Jones — Montane forest. **K.:** Kinakia F. R., ct. coll. A (239) det. P. **Ulu:** Bondwa 1700—1900m, li (6012/L) det. P. (Nig, Cam, Zre, K, Swz, Nat, Cape.)

**169. *Riccardia* cf. *saccatiflora*** (Steph.) S. Arnell — Montane forest. **K:** Limuru, Uplands F. R. Rocks in stream, coll. A (304) det. P. (Cape, Mad, Réu.)

**170. *Asterella abyssinica*** (Gott.) Grolle Syn.: *Fimbriaria abyssinica* Gott. — **SHI:** Near Mufindi, tea nursery of Lupeme Estate, 1900m, on ditch banks (6319/B) det. G.

**171. *Asterella linearis*** (Steph.) Howe Syn.: *Fimbriaria linearis* Steph. Bot. Jahrb. **20** (1895): 302. — Submontane forest belt, roadside banks. **Ulu:** Along the road from Morningside to Bondwa, 1300m, rc (6572/B) det. G. (Usb.)

**172. *Cyathodium africanum*** Mitt. — Lowland and submontane rain forests. **Ulu:** Kimboza F. R. 300m, ru, te (6728/D) det. P. (Gui, Côte d'Ivoire, RCA, S—L, Ghana, Togo, Nig, Cam, S—T, Zre, Congo, Yemen, in Asia from India to Japan widespread.)

**173. *Marchantia parviloba*** Steph. — Roadsides, springs in the montane forest belt. — **Ulu:** Morningside — Bondwa 1400—1500m, rc (6304/A) det. J. **SHI:** Lupeme Estate near Mufindi, tea nursery ditches, 1900m te (6319/A) det. J. (Zre: Lake Albert and Kivu area, Bur, Kat, Cam, S—T, K., T, Kil.)

**174. *Dumortiera hirsuta*** (Sw.) Nees — Montane forests. **Kil:** Mawingo Estate near Mweka, 1350m, ru (6349 AA) det. J. **WUs:** U. F. R. near Kambo waterfalls, 1620m, ru (6374/AO) det. J. (Oceanic subcosmopolite, widespread in tropical and South African mountains.)

## M U S C I

**175. *Ditrichum difficile*** (Dub.) Fleisch. — Subalpine heath. **Run:** NE 2500m, te (6328 D) det. B. (Tropical and subtropical Asia, Mas, SAf. New for East Africa.)

**176. *Ceratodon purpureus*** (Hedw.) Brid. — Subalpine heath. **Kil:** above Horombo hut, 3700m, ru (6249/D) det. B. (Cosmopolite.)

**177. *Distichium capillaceum*** (Hedw.) B. S. G. Syn.: *D. montanum* Hag. — Subalpine rocky vegetation. **Kil:** Marangu route below Horombo hut, 3340m, ru (6247/A) det. P. (Cosmopolite — in the mountains. In tropical Africa: Mer, Kil.)

**178. *Trematodon divaricatus*** Bruch. Syn.: *T. flexifolius* C. Muell. — Montane forest. — **Por:** along road from Isongole to Lake Ngozi, 2000m, rc (6331/B) det. B. (Nat, Rho.)

**179. *Microdus minutus*** (Hampe) Besch. Syn.: *Dicranella minuta* (Hampe) Jaeg. Open woodland. **Ulu:** Morogoro, Faculty of Agriculture Campus, 700m, te (6001/F) det. B. (East African Isles. New for continental Africa.)

**180. *Dicranella borgeniana*** (Hampe) Jaeg. Subalpine elfin forest. **Ulu:** Magari peak 2000—2100m, ru (6297/L) det. B. (Nat. New for East Africa.)

**181. *Dicranella subsubulata*** (Hampe) Jaeg. — Montane forest. **Ulu:** Bondwa N 1800—1900m, ru (6297/L) det. B. (Nat. Rho: Inyanga Mts.)

**182. *Campylopodium euphorocladum*** (C. Muell.) Besch. — Montane mossy forest. **Kil:** Mweka route 1800—2100m, te (6342/AE) det. B. (Wid-spread in Indomalaya and Oceania. In Africa only: Abe.)

**183. *Campylopus alpicolus*** (C. Muell.) Jaeg. — Subalpine heath. **Ulu:** Bondwa top 2120m, te (6262 A) det. B. (Eth, Kil: 3800m.)

**184. *Campylopus* cf. *chlorotrichus*** (C. Muell.) Par. — Montane mossy forest. **Kil:** Umbwe route 2200—2450m, ra (6192/LA) det. B. (Cape, Nat, Tvl, Lesotho.)

**185. *Campylopus* cf. *fusco-lutescens*** Ren. et Card. — Mist effected Brachystegia woodland. **Ulu:** Mt. Mindu 1150—1230m, te (6152/Z) det. B. (East African Islands.)

**186. *Campylopus polytrichoides*** De Not. Syn.: *C. introflexus* (Hedw.) Brid. var. *polytrichoides* (De Not.) Giac. — Montane forest and subalpine heath. **Mer:** E edge of crater rim 2600m, te, ct (6341/AL, AM) det. B. **Ulu:** Mt. Luhungu 1600m, ru (6068/L) det. B; Lupanga SW 1700m, ru (6069/J) det. B. (Oceanic cosmopolite.)

**187. *Campylopus procerus*** (C. Muell.) Par. — Subalpine *Erica arborea* forest, ericaceous heath, seldom in montane mossy forest, mainly in the volcanic mountains. **Kil:** Marangu route 2650—2800m, te (6339/B, 6245/B) det. P; Mweka route 1800—2800m, te (6342/AD, 6718/G) det. P; Umbwe route 1900—2900m, te (6191/E, 6352 AS, 6786/C, 6788/BX) det. P. **Run:** Mt. Rungwe E 2500—2600m, te SW 2450m, te (6504/J, 6766 A) det. P. **Mul:** Lichenya Plateau 1800—2000m, te, coll. R (111766/A) det. P. (Kil: 3000—4800m, Ruw: 2450—4000m, Ken: 2500—3400m.)

**188. *Campylopus schroederi*** Broth. — Subalpine elfin forest, montane mossy forest. **Kil:** Umbwe route 1600—2100m, te (6190/E, 6352/AP) det. B. **Ulu:** Lupanga top 2140m, te (6072 S) det. B; Lupanga S 1700—1900m, te (6285 BF) det. B; Bondwa top 21000m, te, ct (6232 A, 6404 AH) det. B; Lukwangule plateau 2400—2500m, te, (6080/AN) det. B. (Kil, Abe, E—Zre, Uga, 1200—3100m.)

**189. *Campylopus stramineus*** (Mitt.) Jaeg. — On the ground of *Senecio cottonii* — *Alchemilla johnstonii* moorland, and on bark of solitary trees at the timberline. **Kil:** Near Horombo (Peter's) hut, 3700m, tu (6248/N) det. B. **Mer:** E edge of the crater rim, 2600m, ct (6341/AJ) det. B. (Cam, Ruw, Kar, Muh, Elg, Ken, 2900—4550m.)

**190. *Campylopus* cf. *symonsii* Sim.** — Roadside bank in montane forest. **Run:** N slope of Mt. Rungwe 2400m, rc (6333/B) det. B. (Nat: Drakensberg 2500—3000m)

**191. *Dicranum johnstonii* Mitt.** — Montane forest and ericaceous heath. **Kil:** Umbwe route 1900—2100m, te (6352, AN) det. B. **WUs:** U. F. R. 1800m, te (6373/L) det. B. (Ruw, Abe, Kil.)

**192. *Dicranoloma billardieri* (Schwaegr.) Par. var. *scopareolum* (C. Muell.) Thér.** — Montane mossy forest, subalpine elfin forest and ericaceous heath. **WUs.** U. F. R. 1850m, te (6373 M) det. B. **Ulu:** Bondwa N 1700—1900m, ct (6012 J) det. B; Magari peak 2345m, te, ra (6300/S, T) det. B. Var. **patentifolium** (Ren. et Par.) Thér. — Ecology, as by the above var. **Kil:** Mweka route 2150m, ct (6344 AE, AW) det. B. **Ulu:** Lupanga NW 1600m, S 1900—2000m, ru, te, ct (6069/F, 6287/A) det. B; Bondwa 2100m, ct, ra (6232/C) det. B. (Distribution of the sp.: Peru, Chile, Juan-Fernandez, Patagonia, Fuegia, Falklands, Marion and Prince Edward Isls., Australia, New Zealand, SAf, Kil, Mas; the above varieties are known only from the East African Islands.)

**193. *Leucoloma aspericuspis* P. de la Varde** — Montane forest. **WUs:** U. F. R. 1750—1880m, ct (6372/BT) det. B. **Ulu:** Lupanga NW 1450m, S 1700—1900m, ct (6066/Q, 6285 X) det. B; Mwere v. 1600m, li (6180 B) det. B; Magari N 1500—1800m, det. B. **Kan:** S 1370m, ct (6140/P) det. B. (East Africa.)

**194. *Leucoloma bifidum* (Brid.) Brid.** — Subalpine elfin forest, montane mossy forest. **Ulu:** Bondwa peak 2100m, ra (6232 E) det. B. var. **tanganikae** P. de la Varde — **Ulu:** Lupanga S 1500—1900m, ct (6284/X, 6285/V) det. B; S of Kinole sawmill 950m, ct (6172/J) det. B; Bondwa N 1700—1900m, ct (6012/AL) det. B. (Mad, the var.: T.)

**195. *Leucoloma brotheri* Ren.** — Montane forest. **Ulu:** Mwere v. 1450m, ct (6255 E) det. B; Bondwa N 1600—1800m, ct (6227/J) det. B. (Mad, new for continental Africa.)

**196. *Leucoloma cuneifolium* Hampe** — Montane forest. **Ulu:** Lupanga S 1700—1900m, ra (6285/BB) det. B. (Mad, new for continental Africa.)

**197. *Leucoloma sinuosulum* C. Muell.** — Montane forest. **Ulu:** Bondwa N 1600—1800m, ru (6050/AT) det. B. (Mad, new for continental Africa.)

**198. *Leucoloma volkensis* Broth.** — Montane mossy forest, subalpine elfin forest. **Ulu:** Lupanga S 1700—1900m, W 1700m, summit 2140m, ct, ra (6285/Z, 6068 V, 6072 T) det. B; Bondwa 1800—2100m, ct, ra (6230/K, 6232/B) det. B; Mwere v. 1450m, ru (6255 B) det. B; Kinazi NW 1400—1650m, ru (6289/AM) det. B. **Ngu:** above Kwamanga village 1400m, te (6398 E) det. B. (Kil.)

**199. *Leucobryum isleanum* Besch. var. *molle* (C. Muell.) Card. Syn.: *L. molle* C. Muell., *L. juniperoideum* (Brid.) C. Muell. var. *molle* (C. Muell.) Card. — **EUs:** Amani 900m, ct, li (6086/AO, AS, 6091/D) det. B. **Kan:** 1100—1300m, ct, ru (6139 AG, 6140/T) det. B. **Ulu:** Lupanga S 1500—1700m, ct (6284/W) det. B; Mwere v. 1450m, ru (6255, C) det. B; Bondwa N 1700m, E 1600m, SW 1600—1800m, top 2100m, ru, ct, li (6055/J, 6180/A, 6219 D, 6228/B, 6232/F) det. B; Mzinga falls 1150—1450m, ru,**

ct (6266 P, V) det. B; Lukwangule Plateau 2400—2500m, te (6080/AJ) det. B. (Mad, SAf, new for East Africa.)

**200. *Leucobryum mayottense*** Card. Syn.: *Ochrobryum boivinii* Besch. — Montane forests. **Ulu: Kinazi** 1400—1650m, ru (6289/AW) det. B; Bondwa 1900m, ct (6051/BO) det. B; Magari 1500—1800m, Cy (6296/P) det. B. (East Africa? Mad: Mayotte Isl.)

**201. *Leucophanes hildebrandtii*** C. Muell. — Submontane rain forest. **Ngu:** above Kwamanga 1100—1400m, Cy (6397 D) det. B. **Ulu:** Mwere v. 1500m, ru, Cy (6220/G) det. B. (Mad, nem for East Africa.)

**202. *Leucophanes rodriguezii*** C. Muell. — Montane forest. **Ulu:** Mt. Kinazi NW 1650m, ru (6289/AV) det. B. (Mazi, Rod. New for cont. Africa.)

**203. *Octoblepharum albidum*** Hedw. — Rock crevices in dry *Velloziaceae* bush and among *Coleochloa microcephala* tussocks; on the bark of solitary *Phoenix* palms. **Ulu:** Nguru ya Ndege S 600m, N 1000m, ru (6704/O, 6484/E) det. B et P; Mindu E near Kasanga 630m, ru (6541 M) det. P. **Run:** shore of Lake Massoko 1100m, ct (6779/A) det. P. **Z:** above Kundulila falls near Kanona 1480m, ru (6622/E) det. P. (Pantropical, in East Africa e. g. Kil, EUs, Bukoba, Semliki, Uga: Mengo distr.)

**204. *Syrrhopodon lepervenchei*** Besch. — Submontane rain forest. **Ulu:** Mt. Tumbako 900—1000m, ct (6167/C) det. B; Mzinga v. 1450m, ct (6266/O) det. B. (Usb, Réu.)

**205. *Syrrhopodon mildbraedii*** Broth. — Montane mossy forests. **Kil:** Mweka route, Mnangue v. 1900m, ct (6343 F) det. B. **Ulu:** Lupanga S 1900—2000m, ru (6287/C) det. B; Bondwa E 1700—1900m, ct (6260 F) det. B; Mzinga v. 1450m, ct (6266/Q) det. B. (Ruw, Kil. In Gabon only the var. *parvifolius* P. de la Varde.)

**206. *Syrrhopodon quintasii*** Broth. — Submontane and montane forests. **Kan:** S 1100—1300m, ct (6139/AC) det. B. **Ulu:** Lupanga S 1500—1700m, (6284/AC) det. B. (S—T. New for East Africa.)

**207. *Syrrhopodon* cf. *sparsus*** Ren. et Card. — Submontane rain forest. **Ulu:** Mt. Tumbako SE 900—1000m, ct (6167/CA) det. B. (Mad, East Africa?)

**208. *Syrrhopodon spiralis*** Ren. et Card. — Montane forest. **Ulu:** Bondwa N 1700m, ru (6055/H) det. B. (Mad. New for East Africa.)

**209. *Syrrhopodon stuhlmannii*** Broth. — Subalpine elfin forest and montane mossy forest. **Ngu:** above Kwamanga village 1400m, li (6398/D) det. B. **Ulu:** Bondwa E 1700—1900m, top 2100m, te, ct (6260 G, 6404 AA) det. B. (Known only from the Uluguru Mts., 1600m.)

**210. *Calymperopsis subdisciformis*** (Dus.) Fleisch. — Submontane rain forest. **EUs:** Amani 900m, ph (6097 A) det. B. (Lib, Nig, Gab, Zre — new for East Africa.)

**211. *Calymperes intralimbatus*** C. Muell. — Submontane rain forest. **Ulu:** Mt. Tumbako SE 950m, ru (6172/G) det. B. (Gab — new for East Africa.)

**212. *Calymperes perrottetii*** Besch — Submontane rain forest, rocky type. **Ulu:** Kinole Sawmill 950m, ru (6172/H) det. B. (Senegambia, R. C. A., Gab, Zre, EUs: Amani.)

**213. Calymperes sanctae-mariae** Besch. — Dry evergreen coastal forest. **T:** Pande F. R. WNW of Dar es Salaam, 150m, ct (6162/A) det. B. (Mad — new for continental Africa.)

**214. Calymperes usambaricum** Broth. — Lowland rain forest. **Ulu:** Kimboza F. R. 300m, Pa, ph, ct (6188/AB, 6236/G) det. B. (EUs 900—1030m.)

**215. Anoetangium eukilimandscharicum** Dix. Syn.: *A. kilimandscharicum* Broth. nom. illeg. According to M. Bizot this species has a very close affinity to *A. compactum* Schr. = *A. aestivum* (Hedw.) Mitt. — Subalpine *Philippia* heath. **Mer:** E crater edge 2600m, li (6341/AP) det. B. (Kil.)

**216. Anoetangium hanningtonii** Mitt. Syn.: *A. pusillum* Mitt. — On rocks in the montane woodland and forest belt. **Ulu:** Morningside 1300m, ru (6006/V, 6028/B) det. B; Bondwa N 1500—1600m, ru (6004/R) det. B. (T: Kil, Usb, Mt. Mbeya 2400m.)

**217. Weisia** cf. **controversa** Hedw. Syn.: *W. viridula* Hedw. — Montane woodland. **Ulu:** Morningside 1240m, ru (6004/L) det. B. **Uzu:** Kitonga gorge 1100m, ru (6316/N) det. B. **Kip:** Chimala Scarp F. R. above Chimala village, 1450m, te (6335/B, C) det. B. (Cosmopolite.)

**218. Hymenostylium scabrum** (Lindb.) Loesk. Syn.: *H. recurvirostre* (Hedw.) Dix. var. *latifolium* (Zett.) Wijk et Marg. — On the ground of *Senecio cottonii* moorland and in town gardens. **Kil:** Horombo hut (Peter's Hütte) 3700—3800m, tu (6248/D, F) det. B. **South T.:** Mbeya township, garden of M. Hotel 1650m, te (6325/C) det. B. (Circumboreal with altimontane disjunction in tropical Africa; Ken 4400m.)

**219. Oxystegus cylindricus** (Brid.) Hilp. Syn.: *Trichostomum cylindricum* (Brid.) C. Muell. — Montane forest belt. **Ulu:** Bondwa N 1500m, te (6007/M) det. B; Mt. Kinazi NW 1400—1650m, ru (6289/AN, AX) det. B; Luhungu NE 1600m, ru (6058 M) det. B. **SHI:** on planted *Cupressus* near Mufindi village 1900m, (6320 P) det. B. **Run:** Mt. Rungwe NE 2400m, ct (6327/O) det. B. (Cosmopolite.)

**220. Trichostomum** cf. **crispulum** Bruch. — Dry woodland. **Ulu:** Morogoro, Faculty of Agriculture, 700m, ru, te (6001/C) det. B. (Cosmopolite.)

**221. Hydrogonium afrofontanum** (C. Muell.) Hilp. — Dry woodland region. **Usa:** Great Ruaha River gorge near Kidal, 480m, on irrigated rocks of a small waterfall (6314/A) det. B. (Nat — new for East Africa.)

**222. Tortella caespitosa** (Schwaegr.) Limpr. — Submontane and montane forests. **Ulu:** Msanga falls 1150m, ru (6110/S) det. B; Maunga v. above Mzinga village 1500m, ru (6263/D) det. B. **Por:** Ngozi crater rim E 2000m (6331/J) det. B. (Cosmopolite.)

**223. Tortella opaca** Dix. — On travertine deposits in lowland rain forest. **Ulu:** Kimboza F. R. 300m, ru (6188/AD) det. B. (Victoria Falls — new for East Africa.)

**224. Leptodontium stellatum** (Brid.) Ren. — Montane woodland and forest. **Kil:** Nkweseko, near Kimefu stream 1700—1800m, te, ct (6358/C,



6359 AC) det. B. (Central America and East African Islands, new for continental Africa.)

**225. *Leptodontium tenerascens*** Broth. — *Senecio cottonii* moorland.

**Kil:** above Horombo (Peter's) hut 3700—3800m, tu (6248 G) det. B. (Cam 3000m, Ruw, Kar, Muh 4100m, Ken 3400—4100m, Kil 3800m.)

**226. *Leptodontium viticulosoides*** (P. Beauv.) Wijk et Marg. var. **viticulosoides** — Mist effected submontane *Brachystegia* woodland, montane forest, subalpine ericaceous heath. **Mer:** Kitoto 2400—2600m, te, ct (6340 D) det. B. **Kil:** Umbwe route 1600—1900m, te (6190/C) det. B. **WUs:** U. F. R. 1800m, te (6373/K) det. B. **Ulu:** Mt. Mindu 1200m, te (6152/W) det. B. (Central and South America, New Guinea, Java, Taiwan, Assam, Bhutan, Nepal, Réu, Mad, Nat, Rho, Mal, Mer, Kil, Kifinika, Usb, K, Elg, Ruw, Niragongo, Cam.)

**227. *Leptodontium volkensis*** Broth. — Subalpine *Erica arborea* forest.

**Kil:** Marangu route 2800m, te (6245 A) det. P; Mweka route 2600—2900m, te (6718 H) det. P. (Kil, Ken.)

**228. *Hyophila holstii*** Broth. — Dry woodland. **Ulu:** Morogoro, Faculty of Agriculture 630m, ru (6001/D) det. B. (Usb.)

**229. *Hyophila potieri*** Besch. var. **denticulata** Broth. — Montane woodland and forest. **Ulu:** Morningside 1250m, ct (6005/X); Morogoro, behind the Teachers' Training College 600m, ru (6016/G) det. B. **Uzu:** Kitonga gorge 980m, ru (6316/C) det. B. **SHI:** Mufindi Scarp. F. R. near the Fishing Camp, 1720m, ru (6323/V) det. B. (Usb, Réu.)

**230. *Weisiopsis plicata*** (Mitt.) Broth. Mist effected *Brachystegia* woodland. **Ulu:** Nguru ya Ndege SW 1100m, ru (6708/L) det. B. (Usa, Mad.)

**231. *Barbula rigidula*** (Hedw.) Milde var. **acuta** Biz. et Pierrot — **South T:** In the garden of Mbeya Hotel 1650m, te (6325/CA) det. B. (Temperate Eurasia and America, Naf.)

**232. *Semibarbula orientalis*** (Web.) Wijk et Marg. — Rocks in woodland area. **Uzu:** Kitonga gorge above Mahenge 980m, ru (6316/D) det. B. (Widespread in tropical Asia and Africa.)

**233. *Tortula cavallii*** Negri — Rocks in woodland area. **Uzu:** Kitonga gorge ENE of Kokoto 1100m, ru (6316 P) det. B. (Ruw 3900—4100m, Elg, Ken 4100—4900m, Mer 3800m.)

**234. *Tortula hildebrandtii*** (C. Muell.) Broth. Syn.: *T. erubescens* (C. Muell.) Broth. non *T. erubescens* (Mitt.) Mitt. — Montane forests and subalpine ericaceous heath. **Mer:** E slope near Malama 1800m, ct (6338 TA) det. B; Arusha, park trees 1600m, ct (6337/B, C) det. B. **Kil:** NW edge of Shira plateau above Wasendo glade, 2600m, ct (6355/N) det. P; on the stone walls of Mandara (Bismarck) hut, 2700m (6242'A) det. B. (SAf, Eth, East Africa: Elg, Abe, Ken.)

**235. *Rhacomitrium alare*** (Broth.) Par. — Subalpine *Philippia* heath. **Kil:** near Horombo (Peter's) hut 3440—3800m, ru (6247/GA, 6249/F) det. B. (Muh, Ruw, Ken, Mer, Kil, Cam.)

**236. *Rhacomitrium plicatum*** Ren. et Card. — Montane forest belt. **Ulu:** Bondwa N 1600m, ru (6048/E) det. B. (Mad — new for continental Africa.)

**237. Physcomitrellopsis cf. africana** Wag. et Broth. — Montane forest. **Ulu:** Bondwa N 1800—2050m, te (6308/S) det. B. (Nat.)

**238. Funaria marginata** (C. Muell.) Broth. Syn.: *F. ampliretis* (C. Muell.) Broth., *Enthostodon marginatus* C. Muel. — Subalpine spring bogs. **Ulu:** Lukwangule plateau 2400m, tu (6078/P) det. B. (Cape, Nat, Tvl, Rho.)

**239. Tayloria thoméana** (Broth.) Broth. — Montane forest. **Ulu:** Bondwa NE 1740m, ra (6578/AK) det. B. (S—T, Cam, Mad.)

**240. Tetraplodon mnioides** (Hedw.) B. S. G. Syn.: *T. bryoides* (Zoeg.) Lindb. — Subalpine *Philippia* heath and alpine semidesert. Always on old leopard dungs containing bones and hairs of small mammals, probably hyraxes. **Kil:** Umbwe route 3600—3980m between the IInd bivouac and Barranco hut (6792/N, 6797/A) det. P. (Arctic alpine in North America and Eurasia, high alpine in the tropics: Japan, Yunnan, Sikkim, New Guinea, East Africa — Ruw, Abe, Ken 3050—3600m.)

**241. Orthodontium loreifolium** Besch. — Subalpine elfin and *Erica* forest. **Kil:** above Mandara hut 2800m, ct (6245 R) det. B. **Ulu:** top of Mt. Bondwa 2100m, li (6310/C) det. B. (Ruw, Abe, Réu.)

**242. Pohlia cratericola** Broth. Syn.: *Webera cratericola* Broth. Broth. — Montane forests. **Ulu:** Bondwa N 1600—1700m, E 1900—2000m, ru, te (6230 G, 6307/K) det. B. (Nyriragongo 3400m.)

**243. Pohlia philonotula** (C. Muell.) Broth. — Montane forest. **Ulu:** Bondwa N 1550m, te (6606/F) det. B. (SAf.)

**244. Brachymenium borgenianum** Hampe — Woodland and forests, usually on roadside banks. **Ulu:** Morningside 1240m, te, ct, rc (6005/P, 6211/O) det. B; Morogoro, Faculty of Agriculture 650m, ru, te, (6001/E) det. B. **SHI:** Lupeme Estate 1800m, te (6318/AE) det. B. (Mad, Mau, Cape, Tvl, Rho, Usb, Uga; Bunyoro Distr.)

**245. Brachymenium capitulum** (Mitt.) Par. — Mist effected woodland, montane forests. **Ulu:** Mt. Mindu 1200m, ct (6152/AC); Bondwa E 1800—2050m, ct (6308/E) det. B; near Rundi village 1610m, ru (6074/N) det. B. (Uga; Mubende Distr., Kil, East African Islands.)

**246. Brachymenium holstii** Broth. — Mist effected *Brachystegia* woodland. **Ulu:** Nguru ya Ndege SW 750—900m, ru (6708/M) det. B. **SHI:** South of Iringa near Ulele 2000m, ra in dense cushions (6316/E) det. B. (Ruw 2300m, Usb 1600m.)

**247. Brachymenium philonotula** Broth. — **T:** in the garden of Mbeya Hotel 1650m, te (6325 A) det. B. (Madeira, Usb, Mad.)

**248. Brachymenium variabile** Dix. — Roadside trees. **T:** Arusha 1600m, ct (6337/E) det. B. (Uga, Nat, Rho.)

**249. Anomobryum filiforme** (Dicks.) Solms. — Irrigated rocks in a gorge, subalpine *Philippia* belt. **Kil:** below Horombo (Peter's) hut, 3440m, ru (6247 L) det. B. (Circumboreal montane. In South America and in tropical Africa altimontane: Cam, Eth, Ruw, Elg, Muh.)

**250. *Anomobryum laceratum*** Besch. — **Ulu:** on irrigated rocks of Msanga falls ESE from Mzinga, 1150m (6110 O) det. B. (Réu — new for EAF.)

**251. *Bryum alpinum*** Huds. var. **perrevolutum** P. de la Varde — Montane forest belt. **Ulu:** E edge of Lukwangule plateau 2500m, ru (6084/LA) det. B; Luhungu 1600m, ru 6058 D det. B. (Cosmopolite.)

**252. *Bryum areoblastum*** C. Muell. — Submontane forests. **Ulu:** Mt. Tumbako SE 900—1000m, ru, te (6166/D) det. B; near Mzinga falls 1150m, ru (6265/N) det. B. (S—T, Cam — new for East Africa.)

**253. *Bryum argenteum*** Hedw. var. **lanatum** (P. Beauv.) Hampe — On solitary trees or on stone walls. **Kil:** walls of Mandara hut, 2700m (6242/B) det. B. **Ulu:** Morogoro, on planted oil palm stem, 600m (6019 B) det. B. (Cosmopolite.)

**254. *Bryum canariense*** Brid. — Rocks in the woodland belt. **Uzu:** Kitonga gorge near Kokoto 1000m, ru (6318 K, L) det. B. (Circumboreal + SAf: Tvl.)

**255. *Bryum capillare*** L. ex Hedw. — Montane forests and subalpine *Philippia* heath. **Mer:** Kitoto 2450—2600m, li (6340/Q) det. B. **Kil:** near Horombo hut 3440—3800m, ru, te (6247/A, 6248/H) det. B. **Ulu:** Morningside 1240m, ct (6005 N) det. B. (Cosmopolite.)

**256. *Bryum capillare*** ssp. **torquescens** (De Not.) Kindb. Syn.: *B. torquescens* Bruch ex De Not. — Subalpine *Philippia* heath. **Mer:** E crater edge 2600m, ct (6341/AK) det. B. (Cosmopolite.)

**257. *Bryum coronatum*** Schwaegr. — Dry woodland. **Ulu:** Lupanga N 1000m, ru (6018/E) det. B. (Pantropicale.)

**258. *Bryum* cf. *homalobolax*** C. Muell. ex Ren. — Woodland, montane forest and subalpine heath. — **Mer:** E crater edge 2600m, te (6341/AK) det. B. **Ulu:** Mt. Mindu 1200m, te (6152/X) det. B. **SHI:** Lupeme Estate 1800m, rc (6318 AF) det. B. (Mad, Uga, Elg.)

**259. *Bryum ellipsifolium*** C. Muell. — Subalpine *Senecio cottonii* moorland. **Kil:** above Horombo (Peter's) hut 3700—3800m, Se (6348/A, E) det. B. (Kil 3—4000m, Ken 4200—4400m.)

**260. *Bryum leptoneurum*** P. de la Varde — Subalpine *Philippia* heath. **Mer:** E crater edge 2600m, te (6341/AS) det. B. (Mer 3000—3200m. Probably identical with *B. brevinerve* Dix.: Elg 4100m.)

**261. *Bryum perspinidens*** Broth. — Mist effected *Brachystegia* woodland. **Ulu:** Mt. Mindu 1200m, te (6152 V) det. B. (Ruw, Abe, Ken, 2500—3600m.)

**262. *Bryum pseudotriquetrum*** (Hedw.) Schwaegr. Syn.: *B. ventricosum* Relh. — Montane forest. **Ulu:** Bondwa N 1500m, ru (6007/L) det. B. (Cosmopolite.)

**263. *Bryum truncorum*** (Brid.) Brid. — Montane forest belt. **Ulu:** Bondwa N 1550m, te (6006/AD) det. B; near Rundi village 1610m, ru (6074/H) det. B. Pantropical — subcosmopolite.)

**264. *Rhodobryum* cf. *keniae*** (C. Muell.) Broth\*. — Montane and subalpine forests. **Kil:** Umbwe route 1900—2200m, te (6191/G) det. B. **WUs:** U. F. R. 1800m, te (6373/N) det. B. **EUs:** Amani 900m, ru, ct (6086/AJ, 6380/G) det. B. **Kan:** S 1000—1100m, ru, te (6137 BA) det. B. **Ulu:** Lupanga peak 2140m, te (6072/Q) det. B; Bondwa top 2000—2100m, te (6011/Q) det. B; near Rundi village 1610—1700m, ru (6074/K) det B. **Run:** Mt. Rungwe NE 2500m, te (6328 E) det. B. (Elg, Abe, Ken.)

**265. *Rhodobryum* cf. *spathulosifolium*** (C. Muell.) Par. Syn.: *Bryum spathulosifolium* C. Muell. — Montane mossy forest, subalpine *Erica arborea* forest. **Kil:** Umbwe route 1600—1900m, te (6190 D) det. B; Marangu route near Mandara hut, 2650m, te (6239/J) det. B. **Ulu:** Luhungu — Bondwa 1600—1800m, te (6228/C) det. B. **Por:** Lake Ngozi crater rim 2200m, te (6329/AW) det. B. (Nyiragongo, Ken, Kil, Usa—Usb.)

**266. *Rhodobryum umbraculum*** (Hook.) Schimp. — Montane forests. **Kil:** Mawingo Estate below Mweka village 1350m, te (6349/Y) det. B. **SHI:** Mufindi Escarpment, Lupeme Estate 1800m, te (6318/AD) det. B. (Uga: Karamoja Distr. 2300m, Ruw 2800m, Kil 1500m, Usb, Rho, Tvl, Nat, Cape.)

**267. *Mnium rostratum*** Schrad. — Submontane and montane forests. **Ulu:** Msanga falls above Mzinga village 1150m, ru (6110/Q) det. B; Bondwa N 1550m, ct (6007 C) det. det. B. **Por:** Ngozi Lake crater rim 2200m, li (6329/AP) det. B. (Cosmopolite.)

**268. *Rhizogonium spiniforme*** (Hedw.) Bruch. — Montane forests. **Tai:** Mbololo hill 1440—1680m, ct, coll. F (70 542) det. P. **Kil:** Mweka route 2150m, ct (6344/AN) det. P. **Ulu:** Bondwa N 1800—2100m, ct, li (6012/D, 6261/B) det. P. **Mul:** Lichenya plateau 1800—2000m, coll. R (11774, 11780) det. P; Likabula valley 900—1600m, coll. R (11727) det. P. (Pantropicale.)

**269. *Leiomela bartramiioides*** (Hook.) Par. cf. var. ***borbonicum*** Besch. — Usually on *Cyathea* stem associated with *Rhizofabroniaspp.* in montane rain forests. **Kil:** Umbwe route 2100—2200m, Cy (6192/D, 6191/D) det. B. **Ulu:** Bondwa E 1600m, Cy (6180/D) det. B; Magari N 1500—1800m, Cy (6296/N) det. B. (Mad, Jamaica, Venezuela, Ecuador, the var. only in Réunion.)

**270. *Bartramia halleriana*** Hedw. — Subalpine elfin forest. **Ulu:** Magari peak 2000—2100m, ru (6297/M) det. B. (Montane cosmopolite.)

**271. *Bartramia jungneri*** Par. Syn.: *B. aristifolia* Broth. **Ulu:** W edge of Lukwangule plateau, 2500m, ru (6084/K) det. B. (Cam — new for East Africa.)

**272. *Bartramia stricta*** Brid, Musc. Rec. 2 3) (1803):132. Syn. nov.: *Bartramia leikipiae* C. Muell. Flora 48 (1890):479 et *Leiomela stricta* P. de la Varde et Thér., Bull. Soc. Bot. France 87 (1940): 357. — Podocarpus — Juniperus forest. **Mer:** Kitoto and E crater edge 2450—2600m, ct

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\*The genus *Rhodobryum* in Africa form a very difficult group except the easily distinguishable *Rh. umbraculum*. The descriptions of other species do not permit certain identification without studying the type specimens. Even the limitation between *Bryum* and *Rhodobryum* is not clear enough. The genus in Africa badly needs a modern revision.

(6340/U, Z, 6341/AO) det. B. (Atlantic and Mediterranean Europe, Middle East, Colorado, California, Canary and Madeira Isls., East Africa: Elg, Ken, Mer, Kil.)

**273. *Philonotis hastata*** (Dub.) Wijk et Marg. — Rocks, roadside banks and stone walls in the montane forest belt. **Kil:** Mandara (Bismarck) hut 2700m, stone walls (6242/D) det. B; Mweka route 1800—2000m, rc (6342/AC) det. B. **Ulu:** Luhungu 1600m, ru (6058/E) det. B; Bondwa N 1550—1900m, ru, te (6006/E, 6307/G, 6012/AY) det. B; Morningside 1240m, te (6311/Q) det. B; near Kinole sawmill 950m, ru (6171/C) det. B. (Pan-tropical.)

**274. *Philonotis marangensis*** Broth. — Dry woodland and submontane forest belt. **Usa:** Great Ruaha River gorge near Kidal, irrigated rocks of a small waterfall, 480m (6314/A) det. B. **EUs:** Kisiwani 450m, ru (6109/A) det. B. (**Kil:** Marangu 1560m, **EUs:** Amani 900m, **Ken:** Teleki valley.)

**275. *Philonotis ruwensorensis*** Thér. et Nav. — Streambed rocks and cement boulders. **EUs:** Sigi stream 500m, ru (6108/A) det. B. **Ulu:** Msanga falls above Mzinga 1150m, ru (6110/B) det. B; Morogoro, edge of a concrete water tank, 600m (6016/F) det. B. (Ruwenzori 800—2300m.)

**276. *Philonotis schroederi*** Broth. — At a small spring. **Ulu:** Morogoro, behind the Campus of the Faculty of Agriculture, 700m, te (6602/A) det. B. (**Kil.**)

**277. *Philonotis tomentella*** Mol. in Lor. Syn.: *Ph. fontana* (Hedw.) Brid. var. *pumila* (Turn.) Brid. — Subalpine *Senecio cottonii* moorland. **Kil:** near Horombo (Peter's) hut, 3440—3800m, tu, ru (6247/C, 6248/J) det. B. (Circumboreal with tropical montane disjunction in Asia. In tropical Africa known only from Ruw.)

**278. *Breutelia aristaria*** (C. Muell.) Broth. — *Eriocaulon-Sphagnum* bog. **Ulu:** Lukwangule plateau E edge 2400m, tu (6081/N) det. B. (Cape, Nat — new for East Africa.)

**279. *Breutelia stuhlmannii*** Broth. — Subalpine *Erica arborea* forest. **Kil:** Umbwe route near the Ist bivouac and the IInd bivouac, 2850—3330m, te, ru (6788/BM, 6791/B) det. P. (Ruw 3100—4200m, Elg 4150m, Muh 2900—4100m, Kil 3000m, same locality as above, Greenway 3158, Abe 4000—4300m, Ken 2500m.)

**280. *Breutelia subgnaphalea*** (C. Muell.) Par. — Montane mossy forest, Subalpine *Senecio cottonii* moorland and *Philippia* heath. **Mer:** Kitoto 2450—2600m, te (6340/W, 6341/T) det. B. **Kil:** near Horombo hut, 3700—3800m, tu (6248/M) det. B; Umbwe route 1900—2200m, te (6191/H) det. B. (Cam, Ruw, Muh, Elg, Ken, Kivu, Mer, Kil, Run.)

**281. *Erpodium hanningtonii*** Mitt. — On granitic rocks and usually on roadside trees. **K:** Nairobi, Ainsworth hill, on trees of the National Museum's garden 1800m, ct (6608/B) det. P. **T:** Mwanza town at shore of Lake Victoria, 1136m, ru, ct (6198/A) det. P. Morogoro town, on trees of the Boma road, 550m, ct (6142/C) det. B, P. Near Mahenge village NE of Iringa town, 600m ct (6315/A) det. P. (**Kil** and Lake Victoria area, **Usa**, **Z**, **Rho**, **Tvl.**)

**282. *Solmsiella biseriata*** (Aust.) Steere Syn.: *S. javanica* C. Muell., *S. ceylonica* (Thwait. et Mitt.) C. Muell. incl. var. *africanum* P. de la Varde. — Lowland rain forests. On half shady rocks, often associated with *Cololejeunea himalayensis* and *Stereophyllum radiculosum*. **Ulu:** Kimboza F. R. 300m, ru (6188 A) det. B. Same locality where it was collected before by E. W. Jones and described by P. de la Varde as var. *africanum*. **Ngu:** valley behind Mhonda mission, 500m, ru (6433/L) det. P. (USA: Florida, Louisiana, Weeks Isl., Mexico, Taiwan, Ceylon, Java, Assam, Sikkim, Thailand, in Africa as above. See P. de la Varde, Rev. Bryol. et Lichén. 27:141 and I w a t s u k i & S h a r p, Hattori Journ. 30:161—163.)

**283. *Zygodon intermedius*** B. S. G. — Montane forests. **Mer:** E slope 2000m, ct (6339/W) det. B. **SHI:** Mufindi Escarpment near Kilima Tea Factory 1900m, ct (6321/F) det. B. **Por:** Isongole — Lake Ngozi 2000m, ct (6331/C) det. B. **Run:** Mt. Rungwe N 2300m, (6334/Q, AB) det. B. (Pan-tropical, in Africa: Cam, Uga, Tvl.)

**284. *Zygodon seriatus*** Thér. et Nav. — Montane forest. **Kil:** Mweka route 1800—2100m, ra (6342 AA) det. B. (Eth, Ruw, Muh, Ken, Mer, Kil.)

**285. *Zygodon trichomitrius*** Hook. et Wils. — Montane forests. **Ulu:** Morningside 1240m, ct (6005/QB) det. B. **Mer:** Malama 1800m, ct (6338 TB) det. B. (Ruw, Elg, Nyiragongo, Nat, Cape.)

**286. *Rhachithecium perpusillum*** (Thwait. et Mitt.) Broth. Syn.: *Rh. transvaaliense* (C. Muell.) Broth. — Rocky *Acacia* woodland. **Uzu:** Kitonga gorge near Kokoto, 1100m, ct coll. J (6316 E) det. J et B. (Brasil, Argentina, Cam, Nig, Rho, Tvl, Ceylon, E Asia.)

**287. *Macromitrium abyssinicum*** C. Muell. — Montane forest belt. **Kil:** behind Mandara hut, 2700m, ra (6243 G) det. B. **SHI:** on planted *Cupressus* bark near Mufindi village, 1900m (6320/T) det. B. (Eth, Elg, Ken.)

**288. *Macromitrium levatum*** Mitt. Syn.: *M. mannii* Jaeg., *M. undulatifolium* C. Muell. — Montane and subalpine forests. **Mer:** E 2000m, ra (6339/AA) det. B. **Kan:** S 1370m, ct (6140/V) det. B. **Ngu:** above Kwamanga village 1400m, ra (6398 G) det. B. **Ulu:** Lupanga NW 1700m, ru (6069/E) det. B; Bondwa SE 200—2100m, ct (6261/C) det. B; Magari peak 2345m, ra (6300/X) det. B. **SHI:** Mufindi Scarp F. R., near the Fishing Camp 1800m, ct (6324/G) det. B. **Por:** near Isongole village 2000m, ra (6331/H) det. B. This is a very variable species with forms approaching *M. rufescens* Besch. having almost flat leaves. But the pseudomargin formed by the elongated cells below the teeth, restricted only to the upper part of the leaves of *M. levatum* seems to be a good distinguishing character (Gui, Cote d'Ivoire, S—L, Cam, Gab, S—T, Zre, Rho, Tvl, Nat, Mad.)

**289. *Macromitrium mauritianum*** Schwaegr. — Submontane rain forest and mist effected woodland. **EUs:** Amani 900m, ct (6086/AR) det. B. **Ulu:** Mt. Tumbako SE 1000m, ct (6167/S) det. B; Mt. Mindu summit 1200m, ct (6152 AL) det. B. (Usb, Mau, Mad.)

**290. *Macromitrium protractum*** Broth. — Montane forests. **Mer:** E 2000m, ct (6339/Y) det. B. **Ulu:** Bondwa NE 1800—2000m, ct (6012/AS) det. B. (Kil.)

**291. *Macromitrium tristratosum* Dix.** — Mist effected *Brachystegia* woodland. **Ulu:** Nguru ya Ndege SW 1150m, ct (6708/N) det. B. (Nat, Mad — new for East Africa.)

**292. *Groutiella tomentosa* (Hornsch. in Mart.) Wijk et Marg.** Taxon 9 (1960): 51 Syn.: *Macromitrium tomentosum* Horsch. Fl. Bras. 1 (2) (1840) 21, *Schlotheimia goniorrhyncha* Doz. et Molk., *Groutiella goniorrhyncha* (Doz. et Molk.) Wijk. et Marg., *Micromitrium goniorrhynchum* (Doz. et Molk.) Jaeg. *Macromitrium g.* (Doz. et Molk.) Mitt. Syn. nov.: *Groutiella laxotorquata* (Besch.) Wijk. et Marg. Taxon 9 (1960):51, *Micromitrium laxo-torquatum* C. Muell. ex Besch, Ann. Sc. Nat., Bot. Ser. 6(1880):362, *Macromitrium laxo-torquatum* (Besch.) Par., Ind. Bryol. ed. 2(1905) 3:241, *Groutiella sarcotricha* (Broth.) Wijk et Marg. Taxon 9(1960): 51, *Macromitrium sarcotrichum* C. Muell. ex Broth. Bot. Jahrb. 24 (1897):242, *Micromitrium sarcotrichum* (Broth.) Par. Ind. Bryol. ed. 2(1905)3:241. — Submontane rain forests. **Ulu:** Mt. Tumbako, SE 900—1000 m, ra (6189/O) det. B. (Pantropical, in Africa: Cam, Gab, Gui, R. C. A., Zre, Mau.)

**293. *Schlotheimia malacophylla* Besch.** — Montane mossy and sub-alpine elfin forests. **Ulu:** Lupanga NW 1800—2000m, S 1700—1900m, ra (6130 AA, 6285 BH) det. B; Magari peak 2345m, ra (6300/O) det. B. (Réu — new for continental Africa.)

**294. *Schlotheimia percuspidata* C. Muell.** — Mist effected woodland and montane forest. **Ulu:** Mt. Mindu summit 1150—1230m, ct (6152 AF) det. B; Lupanga S 1700—1900m, ra (6285 BA) det. B. (Cape, Nat, Tvl, Rho: Inyanga Mts.)

**295. *Schlotheimia rigescens* Broth.** — Submontane rain forests. **EUs:** Amani 900m, ct (6086/AQ) det. B. **Ulu:** Bondwa N 1550m, ct (6006/X) det. B. (Uga, Usb.)

**296. *Schlotheimia schweinfurthii* C. Muell.** — Lowland rain forest, montane forest and woodland. **Ulu:** Kimboza F. R. 300m, Pa (6022 A) det. B; Morogoro, behind the Teachers' Training College, 700m, ct (6018 D) det. B; Mt. Mindu 1150—1230m, ct, ra (6152/AD) det. B; On rocks along the Rundi — Chenzema road 1610m (6074/L) det. B; Mt. Nguru ya Ndege 1150m, ct (6708/M) det. B. **SHI:** On planted Cupressus near Mufindi village, 1900m, ct (6320/O) det. B. (Central Africa: Mom-buttu.)

**297. *Rhacopilum africanum* Mitt.** — Montane forests. **Ulu:** Bondwa N 1500—2100m, te, li (6030/H, 6185/D, 6011/B) det. B. (Gui, Togo, Cam, Zre, Mer, Kil, Mad, Réu.)

**298. *Rhacopilum macrocarpum* Broth.** — Submontane and montane forests. **Mer:** E 1800—2000m, ct, li (6338/R, 6339/X) det. B. **Kil:** Mawingo Estate near Mweka village, 1350m, ru (6349 X) det. B. **Ulu:** Morningside 1300m, ru (6028/A) det. B; Msanga falls above Mzinga 1150m, ru (6110/P) det. B. (Zre: Beni, Ruw, Kil, 2150—3000m.)

**299. *Rhacopilum plicatum* Ren. et Card.** — Lowland and submontane rain forests. **EUs:** Amani 900m, ct (6086 Z, AM) det. B. **Ulu:** Mormingaide 1240m, te, ru (6004/A 6311/N) det. B; Mt. Tumbako SE 1000m,

ct (6167/H) det. B. **Usa:** Sanje falls near Sonjo in the Kilombero valley, 300m, ru (6144 T) det. B. (Mad; Tropical Africa?)

**300. *Hedwigia ciliata*** (Hedw.) P. Beauv. Syn.: *H. albicans* Lindb. — Subalpine *Philippia* heath. **Kil:** below Horombo (Peter's) hut 3440m, ru (6247 G) det. B. (Cosmopolite. Altimontane in tropical Africa: Elg, Kil, Mal, Mad.)

**301. *Braunia arbuscula*** (Welw. et Dub.) Gepp. — Montane and subalpine forests. **Mer:** E slope near Kitoto, 2450—2600m, te (6340 X) det. B. **Ulu:** near Rundi village 1610m, ru (6074 G) det. B. (Ang, Ruw. Very closely related to the following species, maybe conspecific with it.)

**302. *Braunia camptoclada*** P. de la Varde et Thér. — Montane forest and subalpine *Philippia* heath. **Mer:** E slope 1800—2000m, ct, E crater edge 2600m, ct (6339/V, 6341/AH, 6338/TA) det. B. (Central Africa.)

**303. *Braunia* cf. *secunda*** (Hook.) B. S. G. — Subalpine *Philippia* heath. **Kil:** below Horombo hut 3440m, ru (6247 GA) det. B. Montane pantropical. (In Africa: Naf, Cape, Nat, Tvl, Rho, Mer, Kil, Uga.)

**304. *Rhacocarpus purpurascens*** (Brid.) Par. Syn.: *Anictangium humboldtii* Hook., *Rh. humboldtii* (Hook.) Lindb., *Hypnum purpurascens* Brid. — On rocks in the montane forest and in the subalpine ericaceous belt. **Kil:** Umbwe route, near the IInd bivouac, 3330m, ru (6791/A) det. P. **Ngu:** Mt. Mafulumula above Mnembule village 1850m, ru (6439/J) det. P. **Ulu:** **Lupanga** 1800—1900m, ru (6129/A, 6549/B) det. P, rev. B. **Mul:** Likabula v. 900—1600m, coll. R (11729, 11744) det. P. (Mexico, Antilles, South America from Venezuela to Chile and Juan Fernandez Isls., New Zealand, New Guinea: Mt. Antares, Australia, Tasmania, Réu, Mad. In continental Africa known from Kivu, Kar, Ruw, Muh, Abe.)

**305. *Acrocryphaea robusta*** Broth. — Montane forests. **Kil:** above Mandara hut 2700m, ct (6243/D) det. B. **SHI:** Mufindi Scarp F. R. near the Fishing Camp, 1800m, ct (6324/H) det. B. **Por:** Isongole, near the lower Fishing Camp 2000m, ct (6326/EA) det. B. **Run:** Mt. Rungwe N 2300m, ct (6334/L) det. B. (E—Zre: Mikeno, Rwa: Rugege E, (Abe, T: Ngorongoro crater rim.)

**306. *Leucodon capensis*** Schimp. — Mist effected *Brachystegia* woodland. **Ulu:** Mt. Nguru ya Ndege SW 1150m, ct (6708 Q) det. B. (Cape, Mad — New for East Africa.)

**307. *Leucodon dracaenae*** Solms. — On trees at the subalpine timber line. **Mer:** E crater edge, 2600m, ct (6341AR) det. B. (Eth, Erythraea, Elg, Abe, Ken.)

**308. *Leucodon laxifolius*** C. M. et Fleisch. — Montane forests. **Mer:** E slope near Malama 1800m, ct (6338 T) det. B. **Kil:** above Mandara hut 2700m, ct (6343/K) det. B. (Eth, East Africa.)

**309. *Antitrichia curtispindula*** (Hedw.) Brid. Syn.: *A. kilimandscharica* Broth. — Montane and subalpine forests. **Kil:** above Mandara hut, 2800m, ct (6245 M) det. B. **Mer:** E 2450—2600m, ct (6340/Y) det. B. (Europe, Canary and Madeira Isls., Western North America. Doubtful in SAf. In East Africa: Elg, Ken, Kil, Ruw, between 3500—4300m; Eth.)

**310. *Pterogonium gracile*** (Hedw.) Sm. Syn.: *Pterogonium ornithopo-*



dioides (Huds.) Lindb. — Montane and subalpine forests. **Mer:** E slope 2000m, ct (6339/R) det. P. **Kil:** above Mandara hut 2800m, ra (6245/L) det. P; N edge of Shira plateau above Wasendo glade 2600m, ct (6355/R) det. P. **Ulu:** W edge of Lukwangule plateau above Chenzema village, 2040—2400m, ra (6076/BE) det. B. (Western and South Europe up to Hungary; Syria, Madeira, California, Cape, Tvl, Uga: Mafuga F., Elg, Ken, Mer, Kil, Mad.)

**311. *Prionodon ciliatus*** Besch. Syn.: *P. rehmannii* Mitt. — Montane forests. **Kil:** Marangu route 1900—2200m, ct (6364/H) det. P. **Por:** Lake Ngozi crater rim 2200m, ct (6329/AA) det. B. **Run:** Mt. Rungwe SW 2100—2400m, ct (6764/J, 6765/C) det. P. (Rwa: Rugege F.; Elg, Kil, Ken, Tvl, Nat, Cape, Réu, Mau.)

**312. *Trachypus appendiculatus*** (Ren. et Card.) Broth. — Submontane and montane forests. **Ulu:** Mzinga falls above Mzinga village, 1150m, ru (6265/J) det. B; Lupanga W 1300—2000m, ct, ra (6064/L, 6130/AC) det. B. (New for continental Africa. Known only from Madagascar and from the Himalayas.)

**313. *Trachypus bicolor*** Reinw. et Hornsch. var. **viridulus** (Mitt.) Zant. Syn.: *T. laetus* (Ren. et Card.) Fleisch. — Montane forest. **Ulu:** Mt. Kinazi NW 1400—1650m, ct (6289/AR) det. B. (The species has pantropical distribution. The var.: South East Asia, Central America; in Afr.: Mad, Tvl, S—T.)

**314. *Trachypodopsis laxoalaris*** Broth. — Montane forest. **Mul:** Lichenya plateau 1800—2000m, coll. R. (11795/A) det. P. (Known only from Ruw.)

**315. *Trachypodopsis serrulata*** (P. Beauv.) Fleisch. var. **serrulata** — Montane and subalpine forests. **Kil:** Umbwe route 2200—2450m, ra (6192/K) det. B; Mweka route 2150m, ct (6344/AO) det. P. **Ulu:** Lupanga 1700—2000m, ct, ra (6069/B, 6130/AC) partly det. B; Bondwa peak 1700—2100m, ct, te, ru (6011/H, 6012/S) det. P. **Mul:** Likabula v. 900—1600m, coll. R (11748, 11754) det. P. (Distrib. of the var.: S—T, F—P, Nig, Cam, Rwa, Ruw, Kil, Kivu, Rho, Mul, Tvl, Comores, Mad, Réu, Assam.)

**316. *Pterobryon flagelliferum*** Mitt. Syn.: *Pirella hanningtonii* (Mitt.) Broth. — Submontane and montane forests. **Kan:** S 1100m, ct (6137/AA) det. B. **Ulu:** Lupanga W, S 1350—1900m, ct (6065/R, 6123/F, 6285/U) det. B; Bondwa N 1550—1800m, ct (6006/M, 6227/G) det. B. (EUs: Amani, Ulu: Kitundu, Usa.)

**317. *Jaegerina stolonifera*** (C. Muell.) ssp. **laticuspis** (J. Taylor et P. de la Varde) G. Argent Syn.: *J. laticuspis* J. Taylor et P. de la Varde — Lowland and submontane rain forests. **EUs:** Amani 900m, ct (8086/AP) det. B. **Ulu:** Kimboza F. R. 300m, Pa (6216/C, 6236/D) det. B; Bondwa — Luhungu 1670m, ct (6219/A) det. B; Lupanga 1350m, ct (6065/N) det. B. (Uga, T, Mal. Distrib. of the ssp. stolonifera: K, Uga EUs, SAf, Comores, Mad, Mayotte, India.)

**318. *Calyptothecium hoehnelii*** (C. Muell.) Argent. Syn.: *Renauldia h.* (C. Muell.) Broth. — Montane forests. **Mer:** E 2000m, ct (6339/U) det. B. **EUs:** Amani 900m, ct (6086/X) det. B.: **Ulu:** Kinazi NW 1400—1600, ct

(6289/AP) det. B; Mwere v. 1500m, ru (6157 B) det. B; Bondwa N 1500—1900m, ct (6007 A, 6012/AW, 6260/D) det. B. **SHI**: Lupeme Tea Estate 1750m, ct (6318/W) det. B. **Por**: Lake Ngozi crater rim 2200m, ct (6329 AN) det. B. **Run**: Mt. Rungwe N 2300m, NE 2400m, ct (6334/T, 6327 S) det. B. (Zre: Kivu, Uga: Sese Isls., Abe, Elg, Ken, T, Rwa, Mal, Tvl, Nat, Cape.)

**319. Hildebrandtiella pachyclada** Besch. Syn.: *H. holstii* Broth., *H. pulchroalaris* Broth. ex Reim. — Submontane rain forests. **EU**s: Amani 900 ct (6086/AD) det. B. **Kan**: S 1000—1100m, ct (6137/AC) det. B. **Ulu**: Mt. Mindu 1200m, ct (6152 AM) det. B; Morningside 1260m, ct (6005/J) det. B; Bondwa 1550m, ct (6606 Y) det. B. (Usb, Rod, Mau, Réu.)

**320. Orthostichopsis pinnatella** (Broth.) Broth. — Submontane forest. **Kan**: SE 900m, ru (6136/T) det. P, rev. B. (Usb, Mer.)

**321. Orthostichopsis subimbricata** (Hpe.) Broth. Syn.: *O. chrysonaura* (C. Muell.) Broth., *Pilotrichella chrysonaura* (Hpe.) Jaeg; Syn. nov.: *Pilotrichella pilifolia* (Dix.) Smiths. Misc. Coll. 69 (1918) 8:3—4 + pl. 1 fig. 2. Submontane forests. and mist effected *Brachystegia* woodland. **Ulu**: Mt. Mindu 1200m, ra (6152/AE, AH) det. B; Mkungwe F. R. 800—1100m, ra (6218 D) det. B. (Uga: Mabira near Mubango, Comores, Mad, Réu.)

**322. Squamidium biforme** (Hpe.) Broth. Syn. nov.: *Squ. chlorothrix* (C. Muell.) Broth. Nat. Pfl. fam. 1 3 1906:809; *Pilotrichella chlorothrix* C. Muell. Flora 73 (1890):490; *Squ. rehmannii* (C. Muell.) Broth. Nat. Pfl. fam. 1 (3) (1906):809; *Meteorium rehmannii* C. Muell., Hedwigia 38 (1899):127. — Submontane and montane forests. **Kil**: Umbwe route 1900—2100m, ra (6352 AM) det. B. **Kan**: S 1100—1300m, ra (6139/AB) det. B. **Ulu**: Lukwangule plateau W edge, 2450m, Ba (6084/O) det. B. (Tropical American genus with only two African species. Distr. of *Squamidium biforme*: Ruw, Zre, Kil, Usb, SAf, Mad.)

**323. Squamidium densirameum** (Broth.) Broth. This species is closely allied to the above, but differs by its much more branched and larger shoots. According to Cardot *Squ. biforme* var. *congestum* Ren. et Card. is synonymous with *S. densirameum*. — Mist effected *Brachystegia* woodland, montane and subalpine forests. **Ulu**: Mt. Mindu 1200m, ra (6152/AA) det. B; Luhungu 1550m, ra (6059 F) det. B. (Known only from Usb.)

**324. Pilotrichella ampullacea** (C. Muell.) Jaeg. — Submontane and montane forests. **Kil**: above Mandara hut 2800m, ra (6245/W) det. B; Umbwe route 1900—2450m, ra (6192/L, 6352 AK) det. B. **Kan**: S 1100—1300m, ra (6139/AA) det. B. **Ulu**: Mwere v. 1400—1600m, ct (6158/F) det. B; Lukwangule plateau W edge 2400—2500m, ra (6080 AK) det. B. **SHI**: Lupeme Estate 1750m, ct (6318 Z) det. B. (Abe, Ken, Kil, Usb, Comores.)

**325. Pilotrichella cuspidata** Broth. — Montane forests. **Mer**: near Malama 1800m, ct (6338/U) det. B. **Kil**: Umbwe route 1900—2000m ra (6191/J) det. B. **Por**: Lake Ngozi crater rim 2200m, ra (6329 AO) det. B. (Ken, Mer, „Pondoland“.)

**326. *Pilotrichella holstii*** Broth. — Submontane rain forest. **Kan:** S 1100—1300m, ct (6139 AA) det. B. (Known only from Usb.)

**327. *Pilotrichella isleana*** Besch. Syn.: *P. imbricatula* C. Muell. — Submontane rain forest. **Ng:** above Kwamanga village, E 1100—1400m, ra (6397/E) det. B. (Kil, Usb, Mad, Réu.)

**328. *Pilotrichella perrobusta*** P. de la Varde — Subalpine elfin forest, sometimes in montane mossy forest. **U:** Lupanga crest 1700—2140m, ra (6285/BD, 6072/R) det. B; Bondwa top 2050—2100m, ra (6232/D) det. B. (Distributed in the Mascarene Islands, but closely allied, if not identical, with the tropical American *Pilotrichella flexilis* (Sw.) Jaeg. New for continental Africa.)

**329. *Pilotrichella pilifolia*** Dix. — Lowland and montane rain forests. **U:** Kimboza F. R. 300m, ra (6023 B) det. B; Luhungu — Bondwa 1600—1800m, ct (6227 F) det. B; Lupanga WNW 1800—2100m, ra (6071 AM) det. B. (Ug: near Mubango 1200m.)

**330. *Papillaria africana*** (C. Muell.) Jaeg. — Mist effected woodland, submontane and montane rain forests. **Mer:** E 1800—2600m, ct, ra (6338/S, 6339 T, 6340/AA) det. B. **Kil:** Umbwe route 2650m, ra (6194/E, G) det. B; above Mandara Bismarck hut 2700m, ct (6243 C) det. B. **U:** Mt. Tumbako 900—1000m, ra (6189/M) det. B; Mt. Mindu 1150—1230m, ct, ra (6152/AG) det. B; Nguru ya Ndege SW 1100m, ru (6708/J) det. B. **SHI:** Lupeme Estate near Mufindi 1750m, ct (6318,U) det. B. (Widespread in East and South Africa and on the East African Islands.)

**331. *Aerobryidium subpiligerum*** (Hampe) Card. in Grand., Hist. Magdag. 39 (1915):357. Syn.: *Neckera subpiligera* Hampe, Linnaea 38 (1874): 217, *Aerobryopsis pseudocapensis* (Ångstr.) Fleisch. Hedwigia 44 (1905): 306, *Aerobryidium lanosulum* (C. Muell.) Fleisch. in Broth., Nat. Pfl. fam. 1 (3, 1906):820. Syn. nov.?: *Aerobryopsis cymatocheilos* (C. Muell.) Broth. Nat. Pfl. fam. 1 (3, 1906):819; *Eriocladium cymatocheilos* C. Muell., Flora 73 1890:493. — Submontane, montane and subalpine forests. **EU:** Amani 900m, ct, ph (6086 G, AC, AK; 6097 B) det. B. **U:** Mt. Tumbako 1000m, ra (6167/O) det. B; Lukwangule plateau W 1000—2400m, ra (6076 BF) det. B. **SHI:** Mufindi Scarp F. R., by the stream near an artificial lake, 1720m, ra (6323 W) det. B. (Kil, Comores, Mad, Réu.)

**332. *Floribundaria floribunda*** (Doz. et Moelk.) Fleisch. — Submontane and montane rain forests. **U:** Mwere v. 1500—1600m, li, ct, ph (6160/B, 6181 G, 6180/H, 6221/B, 6256/A) det. B; Magari N 1500—1800m, ct (6296/L, MA) det. B. **Ng:** above Kwamanga village, 1100—1400m, ph (6397/AA) det. B. **Por:** Lake Ngozi crater E 2100—2250m, Ba, ct (6329/BS, 6330/P) det. B. (East and South Africa, tropical Asia and Oceania. The vicariant *F. cameruniae* (Dus) C. Muell. occurs in West Africa. Its easternmost occurrence is in the Ruwenzori Mts. The two species differ only by their sporophytes, which are extremely rare. On the other hand, even these sporophyte characters seem to be uncertain. It can happen after careful examination, that *F. cameruniae* will proved to be a synonyme of *F. floribunda*.)

**333. *Floribundaria patentissima*** (C. Muell.) Fleisch. — Mist effec-

ted *Brachystegia* woodland, montane and submontane rain forest. **Ulu:** Mt. Mindu 1150—1230m, te, ra (6152 Y, AN) det. B. **SHI:** Lupeme Estate near Mufindi 1750m, ct, ra (6318/AB) det. B. **Por:** Isongole 2000m, ra (6331/G) det. B. **Run:** Mt. Rungwe N 2300m, ct (6334/O, P) det. B. — var. **squarrosa** Ren. et Card. **EUs:** Amani 900m, ct (6086/G) det. B. **Por:** Lower Fishing Camp near Isongole 2000m, te (6326 C) det. B. (S—T, R. C. A., Gab, Usb; the var. *squarrosa*: Mad, Réu — new for cont. Africa.)

**334. *Catagonium nitens*** (Brid.) Card., in Grand., Hist. Madag. 39 (1915): 469. Syn.: *Leskea nitens* Brid., Spec. Musc. 2 (1812):50, *Catagonium aubertii* Schwaegr. Broth., Nat. Pfl. fam. 1 (3, 1908):1088, etc. Syn. nov.: *Catagonium mucronatum* (Jaeg.) Broth., Nat. Pfl. fam. 1 (3, 1908): 1088; *Acrocladium mucronatum* Jaeg., Ber. S. Gall. Naturw. Ges. 1876—77 (1878):443; *Catagonium politum* (Hook. f. ex Wils.) Dus. ex Broth., Nat. Pfl. fam. 1 (3, 1908):1088, 1237; *Hypnum politum* Hook f. et Wils., London J. Bot. 3 (1844):553; *Eucatagonium mucronatum* (Jaeg.) Broth. Nat. Pfl. fam. ed. 2, 11 (1925):178; *Eucatagonium politum* Hook f. et Wils. Broth., 1. c. — Submontane and montane forests, usually on shady rocks. **WUs:** U. F. R., Kambo falls 1600m, te, ct (6347/AM) det. P. **Ulu:** Lupanga NW 1600m, ru (6122/A) det. P, rev. B; Mwere v. 1500m, ru (6255/A) det. P; Bondwa E 1700—1900m, ct (6260/C) det. P; Bondwa N 1700m, ru (6055 E) det. P; Msanga falls above Mzinga village 1150m, ru (6110 B) det. P. (Cape, Nat, new for East Africa, Mad, Mas, Fuegia, Patagonia, Chile, Ecuador, Venezuela, Bolivia, Kerguelen, Australia, Tasmania, New Zealand, New Guinea: B. O. van Zanten in litt.)

**335. *Leptodon smithii*** (Hedw.) Web. et Mohr. var. **beccarii** (C. Muell.) Tong. — Relatively dry type of montane forests. **Mer:** Ngurdoto crater rim 1800m, ct (6213/A) det. P; Malama 1800m, ct (6338 V) det. P, rev. B. **Kil:** Wasendo glade 2600m, ct (6355 Q) det. P. **WUs:** saddle between Magamba and Mabweni 1850m, ct (6205 B) det. P. (In Africa: Naf, Cape, Nat, Tvl, Kil, Uga, the var. *beccarii* was known only from Eth. World distribution see on maps made by Herzog 1926:284, Pócs 1960, Nelson 1973:434—437.)

**336. *Neckera platyantha*** (C. Muell.) Par. — Subalpine *Erica* forest. **Kil:** Umbwe route 2700m, ra (6194 F) det. B. (Elg up to 4050m, Kil.)

**337. *Neckera remota*** Bruch. et Schimp. ex C. Muell. — Montane and subalpine mossy forests. **Mer:** Kitoto 2450—2600m, ct (6340/AB) det. B. **Ulu:** Lukwangule plateau W 2040—2400m, ra (6076 BC) det. B. **Run:** Mt. Rungwe N 2300m, ct (6334 W) det. B. (Cam, SAf?, Eth?, Middle East.)

**338. *Neckera submacrocarpa*** Dix. — Subalpine *Erica* forest. **Kil:** above Mandara Bismarck hut, 2600, ct (6245 P) det. B. (Elg.)

**339. *Neckeropsis lepineana*** (Mont.) Fleisch. — Lowland rain forest. **Ulu:** Kimboza F. R. 300m, ru (6236/F, 6188/AS) det. P, rev. B. (Widespread in tropical Asia and Oceania, see map of Touw 1962:389. In Africa: Cam, Uga, T: Bukoba, Usb; Cape, Comores, Mad, Mau.)

**340. *Pinnatella oblongifrondea*** (Broth.) Broth. — Lowland and submontane rain forest. **WUs:** U. F. R. near Kambo 1620m, ct (6347/AP) det. B. **EUs:** Amani 900m, ct (6086/AA) det. B. **Ulu:** Mwere v. 1400—

1600m, ct (6158 J) det. B; Kimboza F. R. 300, Pa (6216/N) det. B; Maunga v. above Mzinga 1500m, ct (6263 E) det. B. (It was known only in Usb.)

**341. *Pinnatella tamariscina*** (Hampe) Broth. — Submontane and montane rain forests. **EUs:** Amani 900m, ct (6086 AL) det. B. **Kan:** S 1370m, ct (6140/S) det. B. **Ulu:** Lupanga 1300—1500m, ct (6066/R) det. B. Kinazi NW 1400—1650m, ct (6289/AQ, AS) det. B. (Cam, Mas — new for East Africa.)

**342. *Porotrichum comorense*** Hampe — Submontane rain forest. **EUs:** Amani 900m, ct (6086/AE, W) det. B. (Widespread in tropical Africa.)

**343. *Porotrichum ramulosum*** (Mitt.) Dus. — Submontane rain forest. **Ngu:** W of Mhonda Mission 800—1000m, ct (6400 F) det. B. (Cam — new for East Africa.)

**344. *Porotrichum ruficaule*** C. Muell. — Montane forest. **Kil:** Marangu route 2320m, ra (6238/D) det. B. (Kil.)

**345. *Porotrichum subpennaeforme*** C. Muell. — Montane and subalpine forests. **Kil:** above Mandara hut 2800m, ct (6245/V) det. B. **Ulu:** Lupanga S above Mbete village 1700—1900m, ct (6285 N) det. B; Bondwa E 2030m, (6120/E) det. B. (Abe, Ken, Kil. Maybe *Porothamnium pennaefrondeum* (C. Muell.) Card. also belongs here.)

**346. *Porothamnium hildebrandtii*** (C. Muell.) Fleisch. Definitely not conspecific *Porotrichum comorense* Hampe, as it was treated by Sim 1926:402 and accepted by Index Muscorum 4 (1967):174. — Submontane, montane forests. **Kil:** Mnangue river v. above Mweka 1900m, ru (6343 G) det. B; Mawingo Estate below Mweka 1350m, ru (6349 Z) det. B. **WUs:** U. F. R. 1750—1880m (6372/BX) det. B. **Kan:** S 1370m, ct (6140 U) det. B. **Ngu:** above Kwamanga village 1100—1400m, ru (6397/F) det. B. **Ulu:** Lupanga W 1350—2100m, ct (6066/S, 6071/AN, 6122/B) det. B; Kinazi 1400—1650m, ru (6289/AR) partly det. B; Mwere v. 1600m, ru (6179/A) det. B; Mzinga falls 1150—1450m, ru (6265 O, 6266 R) det. B; Magari N 1500—1800m, ru (6295 J) det. B. **Por:** crater rim of Lake Ngozi 2200—2250m, ct (6329/BR) det. B. **Run:** Mt. Rungwe N 2300m, ct (6334 M) det. B. (F—P, S—T, Gui, Cam, Ang, SAf, Usb, Ruw, Elg, Kil, Comores, Mad.)

**347. *Rigodium kilimandscharicum*** (Broth.) Par. — Montane mossy and subalpine elfin forests. **Kil:** above Mandara hut 2700m, ct (6243 B) det. B. **WUs** U. F. R. 1800m, ct (6372 BS) det. P. **Ulu:** Lupanga S 1700—1900m, ct (6285 B, 6468 B) det. P; Bondwa SE 2000—2100m, N 1700—2100m, NE 1900—2050m, NW 1600—1800m, ct, ra (6261 F, 6012/P, 6051/CP, 6052/CP, 6599/F, 6782/B, 6227/R) det. P; Lukwangule plateau 2350—2500m, ct (6080 AV, 6827 AD) det. P. **Uka:** Mnyera ridge 1900—2100m, ct (6739/H, 6870/H) det. P; Mt. Kifigo SE 1800m, ct (6592 J) det. P. **Mul:** Likabula v. 900—1600m, ct coll. R (11745, 11752) det. P; Lichenya plateau 1800—2000m, ct coll. R (11972) det. P. (Kil, Usb.)

**348. *Daltonia angustifolia*** Dozy et Molk. — Montane rain forests. **Kil:** Umbwe route 2200—2450m, ct (6192 J partly) det. B. **Ulu:** Mwere v. 1500m, ra (6220 D partly) det. B; Bondwa N 1600—1700m, ru (6307/G partly) det. B. (Ceylon, Java, Borneo, Luzon, New Zealand, Australia, Tasmania, Mascarene Isls. In continental Africa only Cam, Moz.)

**349. *Daltonia patula* Mitt.** — Montane mossy forests. **Kil:** Umbwe route 2200—2450m, ct (6192 J partly) det. B. **Ulu:** Bondwa N 1800—2000m, ct (6012/BL) det. B. (F—P, Kil, Usa. The above name is illegitimate.)

**350. *Distichophyllum africanum* Dem. et P. de la Varde** — Montane forest. **Ulu:** Bondwa E 1600m, ph (6181 A partly) det. B. (The only African species of an Indomalayan-Oceanian genus, known only from the type locality in the Ruwenzori Mts., at 3150 m alt.)

**351. *Leskeodon mniifolium* (Hornsch.) Bizot comb. nov.** Basionym: *Hookeria mniifolia* Hornsch., *Linnaea* 15 (1841):141. Syn.: nov.: *Distichophyllum mniifolium* (Hornsch.) Sim, *Trans. R. Soc. S. Afr.* 15 (1926):441; *Mniadelphus horschuchii* C. Muell., Syn. 2 (1850):22; *Leskeodon densiretis* (Broth.) Broth., *Nat. Pfl. fam.* 1 (3, 1907):926; *Distichophyllum densirete* Broth., *Bih. K. Svensk. Vet. Ak. Handl.* 21 Afd. 3 (3, 1895):42. The Tanzanian plant is definitely conspecific with the type of *L. densiretis* (Broth.) Broth. from Brasil. According to the diagnose of *Hornschuch* there is no specific difference between *Hookeria mniifolia* Hornsch. and *L. densiretis*, except the size of cells, being 2—6 and 6—8 $\mu$ . Sorry the type specimen of *Hornschuch* was destroyed during the II World War. — Montane forest. **Ulu:** Bondwa E 1600m, ph (6181/A partly) det. B. (Brasil, Saf.)

**352. *Eriopus asplenioides* (Brid.) Besch. Syn. nov.:** *E. mniaceus* (C. Muell.) Broth.; fide M. R. Crosby — Montane rain forest. **Ulu:** Mwere v. 1600m, ru (6179 C, 6257 E) det. P; Mt. Tumbako 1510m, ru (6876/X) det. P. (Cape, Comores, Réu.)

**353. *Cyclodictyon brevifolium* Broth.** — Montane and subalpine forests. **Kil:** Umbwe route 2450—2650m, Cy (6193 C) det. B; Mweka route 2150m, ct (6344/AA partly) det. B; above Mandara hut 2800m, ct (6245/T) det. B. **Ulu:** Bondwa N 1600—2100m, ru, te (6307 H, 6309/L) det. B. (E—Zre: Kivu area; Rwa: Rugege forest, 1800—2600m.)

**354. *Cyclodictyon vallis-gratiae* (Hampe) O. Kuntze** — Submontane and montane rain forests. — **Ngũ:** W of Mhonda mission 800—1000m, ct (6400 G) det. B. **Ulu:** Lupanga NW 1800—2000m, ra (6130 AB) det. B; Bondwa N 1450m, li (6030 E) det. B; Mt. Tumbako SE 1000m, te, ru (6166 A) det. B. — var. *breutelianum* (Hampe) Dem. et P. de la Varde — **Ulu:** Bondwa E 1600m, ru (6179/B) det. B; Maunga v. above Mzinga village 1500m, ru (6263 C) det. B. Mt. Tumbako 1000m, te, ru (6166/B) det. B. (Cam, Cape, Nat, Tvl, Comores.)

**355. *Callicostella africana* Mitt.** — Submontane and montane forests. **EU:** Amani 900m, li (6091 C) det. B. **Ulu:** Bondwa E 1600—2000m, te, li (6011/W, 6180/G) det. B. (F—P, Nig, East African Isles.)

**356. *Callicostella usambarica* (Broth.) Broth.** — Submontane rain forest. **Ulu:** Mt. Tumbako 1000m, ct, li (6167/A, G, L) det. B. (Usb only.)

**357. *Hookeriopsis mittenii* P. de la Varde** — Montane forest. **Ulu:** Mt. Kinazi NE 1400—1650m, te (6289/AB) det. B. (F—P, Cam, Elg, Kil, Uga: S Mengo Distr, and Sese Isls.)

**358. *Hookeriopsis pappeana* (Hampe) Jaeg.** — Montane forests. **Kil:**

Mweka route 2150m, ct (6344/AA) det. B. **Ulu:** Bondwa N 1600—1700m, te (6307) det. B. (Cape, Nat, T: Bukoba Distr.)

**359. *Lepidopilidium devexum* Mitt.** — Montane mossy forest. **Ulu:** Lupanga 1800—200m, ru, te (6129/B) det. B; Bondwa N 2020m, te (6403/AB) det. B. (Cam — new for East Africa.)

**360. *Lepidopilidium hanningtonii* (Mitt.) Broth.** — Montane and subalpine forests. **Ulu:** Mwere v. 1500—1600m, ph, ra (6176 A, 6181/D) det. B; Bondwa top 2100m, ra (6309/H partly) det. B. (Ruw, Usa.)

**361. *Lepidopilium dusenii* C. Muell.** — Subalpine elfin forest. **Ulu:** Bondwa top 2100m, ra (6309/H) det. B. (Cam — new for East Africa.)

**362. *Lepidopilium lastii* Mitt.** — Montane forests. **Ulu:** Mwere v. 1600m, ra (6180 F, 6256/T) det. B; Bondwa N 2020m, te (6403/AD partly) det. B. **Por:** Ngozi crater rim 2000m, Ba, ra (6330/R) det. B. (Usa only.)

**363. *Leucomium golungense* Grepp.** — Submontane rain forests. **EUs:** Amani 900m, li (6091/F) det. B. **Ulu:** Mt. Tumbako SE 1000m, ct (6167/T) det. B. (Ang, Gab, F—P, Zre. New for East Africa.)

**364. *Lopidium pennaeforme* (Brid.) Fleisch.** — Submontane and montane forests. **Ulu:** Lupanga WNW 1350—2050m, ct., Cy (6065/Q 6550/H) det. B; Mwere v. 1500m, ct (6158/M) det. B; Bondwa 1800m, ct (6012 C) det. B. (Cape, Pondoland.)

**365. *Hypopterygium mildbraedii* Broth.** — Montane forest. **Ulu:** Bondwa E 1700—1900m, ct (6260 J) det. B. (Kar, Elg, Kil.)

**366. *Hypopterygium viridissimum* C. Muell.** — Submontane and montane forests. **Mer:** Malama 1800m, ct, ru (6338 Y, Z) det. B. **Kil:** Marangu — Old Moshi 1700m, ct (6368 Z) det. B. **EUs:** Amani 900m, ru, li, concrete pillars (6090 C, 6091/E) det. B. **Ulu:** Tumbako 900—1000m, ct (6167/E) det. B; riverine forest behind Morogoro TTC 600m, ru (6016/E) det. B. Bondwa N 1450—2000m, ct, li (6185/E, 6011 M) det. B; Mzinga v. 1450m, ct (6266/X) det. B. (Tropical and subtropical America, in Afr.: F—P, Cape, Nat, Tvl, Usb, ElEg, Abe, Uga, Rho, Comores. Very closely related to *H. laricinum* (Hook.) Brid., *H. grandistipulaceum* Ren. et Card., *H. hildebrandtii* C. Muell. and *H. usambaricum* Broth. A further study should prove them to be conspecific.)

**367. *Cyatophorella africana* (Dix.) Broth.** The Tanzanian plants have double peristome. — Submontane and montane forests. **Ulu:** Bondwa N above Morningside 1400—1450m, ct, ru (6185 B, 6854 D) det. P; Mlulu v. above Tangeni 1450—1550m, ct (6558 F) det. P. **SHI:** Lupeme Estate 1750m, ct coll. Paget-Wilkes, det. P; Mufindi Scarp F. R. near Kilima Tea Factory 1900m, ra (6321 E) det. P. (Eth: Argio, Uga, Abe.)

**368. *Fabronia congolensis* Card.** — Relatively dry montane forest. **Mer:** Ngurdoto crater rim 1800m, ct (6213 B) det. B. (Zre — new for East Africa.)

**369. *Fabronia leikipiae* C. Muell.** — **T:** On park trees in Mbeya town, 1650m (6325/D) det. B. (Eth: Addis Abbeba, Abe, Mer, Rho: Zimbabwe.)

**370. *Fabronia longipila* Broth.** — On planted trees and on trees and rocks of open woodlands. **T:** Mwanza town near Lake Victoria 1136m, ct (6198 B) det. B. Arusha town 1600m, ct (6337/A) det. B. **Kil:** Lyia-

mungu, 1260m, on planted coffee (6195 F) det. B. **Ulu:** Morogoro, Kigunyembe Mission 600m, on planted *Elaeis* stem (6019/A) det. B; Morogoro river v. above Bahati Camp, 1000m, on planted *Cocos* stem (6159 A) det. B; Mt. Nguru ya Ndege SW 600m, ru (6704 R) det. B. **Usa:** Kilombero Scarp F. R. above Kidatu, on *Borassus* stem, 600—700m (6143/H) det. B. **Uzu:** Kitonga gorge near Kokoto 1100m, ct, ru (6316 H. J) det. B. (Kil, Usb.)

**371. *Fabronia pilifera*** Hornsch. Syn.: *F. angolensis* Welw. et Dub., fide Sim. it is probably conspecific with *F. longipila* Broth. too. — Submontane forest — woodland transition. **Ulu** Morningside 1240m, ct (6005/T) det. B. (Ang, Cape, Nat, Tvl, Rho, Uga, East Africa Isls.)

**372. *Rhizofabronia perpilosa*** (Broth.) Broth. On phaner. trees in montane and subalpine forest of volcanoes. **Mer:** Kitoto 2000, ct, coll. Vesey-Fitzgerald (13/7/1968) det. B. **Kil:** NW edge of Shira plateau above Vasingo glade 2600m, ct (6355/A) det. P; above Mandara hut 2800m, ct (6245/F) det. P. (Cam, Elg, Abe, Mer, Nyiragongo.)

**373. *Rhizofabronia persoonii*** (Schwaegr.) Fleisch., incl. transitions to var. *sphaerocarpa* (Dus.) Bizot. — Montane rain forests, mostly on tree fern stems. **Ulu:** Bondwa N, common at 1700—2100m, Cy (6051/BB, BD, 6052 AA, etc.) det. P. — var. *sphaerocarpa* (Dus.) Bizot, Acta Bot. Hung. 18 (1973):14 Syn.: *Rh. sphaerocarpa* (Dus.) Fleisch., *Fabronia sphaerocarpa* Dus. — **Ken:** Castle Forest Station 2000m, Cy coll. F, det. P. **Kil:** Umbwe route 2100—2200m, Cy (6192/C, 6191/C, 6353 A) det. P. **Ulu:** Mwere v. 1550—1600m, Cy, ct (6268 A, 6158 Z) det. P; Bondwa N, E 1700—1900m, Cy, ct, ru (6012/BG, 6051 BA, BC, 6260 B) det. P. (Cam, Rwa, Usb, Ruw, Réu, Mau.)

**374. *Regmatodon secundus*** Kiaer., Forh. Vid. Selsk. Christiania 1882 24:38, 3 f. 5—7; 3 f. 1—5. Syn.: nov.: *R. newtonii* Broth., Bot. Jahrb. 24 (1897):281; *R. brevicuspis* P. de la Varde et Leroy, Bull. Jard. Bot. Brux. 18 (1947):182, et f. 16. — Subalpine *Hagenia* forest. **Run:** NE 2400m (6327 J) det. B. (F—P, Zre: Kivu, Elg, Mad.)

**375. *Pseudoleskea dispersa*** C. Muell. — Montane bamboo and mossy forests. **Por:** Isongole, lower Fishing Camp 2000m, ct (6326/EA) det. B; E slope of Ngozi crater 2100m, ct (6330 X) det. B. **Run:** Mt. Rungwe N 2300m, ct (6334/U, AD) det. B. (Cam, Ken, Kil.)

**376. *Haplocladium angustifolium*** (Hampe et C. Muell.) Broth. — Submontane forest. **Ulu:** Bondwa N 1550m, ct (6006 T) det. B. (Southern Eurasia, In Africa: Cape, Tvl, Nat, Zre, Uga, Ruw.)

**377. *Thuidium borbonicum*** Besch. — Submontane riverine forest. **Ulu:** Morogoro, valley behind the Teachers' Training College 1000m, ru (6046/O) det. B. (Cam, Nat, Victoria Falls, Uga, Réu.)

**378. *Thuidium involvens*** (Hedw.) Mitt. — Lowland rain forest. **Ulu:** Kimboza F. R. 300m, ru limestone (6236 HA) (South America. The var. *thoméanum* Broth. is known from S—T, Gab.)

**379. *Thuidium laevipes*** Mitt. — Submontane rain forest. **EUs:** Amani 900m, on concrete pillars (6090 B) det. B. (Cam, Gab, R. C. A., Elg, Uga, Kil, Usb, Tvl.)



**380. *Thuidium loricaleycinum*** (C. Muell.) Kindb. — Montane and subalpine forests. **Mer:** E 2450—2600m, te coll. Vesey-Fitzgerald, det. B. **Kil:** Mandara hut 2800m, te (6245/Z, AA) det. B. (Ruw, Ken, Mer, Kil.)

**381. *Thuidium sublaevipes*** Dix. Probably only a more branched variety of *Th. laevipes* with a bit wrinkled seta. — Submontane forests. **Ulu:** Lupanga 1350m, ct (6065 P) det. B; Mzinga v. above the falls, 1450m, ct (6266 L) det. B. (Known only from the type locality: Tvl.)

**382. *Thuidium tamariscinum*** (Hedw.) B. S. G. — Subalpine elfin forest. **Ulu:** Lukwangule plateau 2500m, te (6080 AM) det. B. (Temperate Eurasia, Temperate and tropical America, Madeira, Açores, on the African continent: Kilimanjaro, where was reported by Mitten, but according to Sim 1920:388 this belongs to *Th. promontorii* C. Muell. Par.)

**383. *Thuidium versicolor*** (C. Muell.) Broth. — Montane forest. **SHI:** Lupeme Estate near Mufindi 1750m, ct (6318/V) det. B. (Cape, Nat, Tvl, Rho, Usb, E—Zre, Mer, Elg, Eth.)

**384. *Drepanocladus uncinatus*** (Hedw.) Warnst. — *Senecio cottonii* moorland. **Kil:** Above Horombo (Peter's) hut 3700—3800m, tu (6248/K) det. B. (Temperate Eurasia and America, Australia, Antarctic islands, N Af and SAf. In tropical Africa: Ruw, Elg, Ken, Mer, Kil.)

**385. *Hygrohypnum hedbergii*** P. de la Varde — Irrigated basaltic rocks in the subalpine *Philippia* zone. **Kil:** below Horombo hut 3440m, ru (6247/DA) det. B. (Kil. 3750m, Ken 4150m.)

**386. *Platyhypnidium riparioides*** (Hedw.) Dix. Syn.: *Eurhynchium rusciforme* Mild. — Irrigated basaltic rocks and *Senecio moorland* in the supalpine *Philippia* zone. **Kil:** Below Horombo hut 3440m, ru (6247 DB) det. B; above Horombo hut 3700—3800m, tu (6248/C partly det. B.) (Cosmopolite, but altimontane in tropical Africa.)

**387. *Palamocladium sericeum*** (Jaeg.) Broth. — C. Muell. Syn.: *Pleuropus sericeus* (Jaeg.) Broth. — Submontane and montane forests, subalpine vegetation. **Mer:** Kitoto 2460—2650m, ct (6340/C) det. B; Malama 1800m, ct (6338 X) det. B. **Kil:** below Horombo hut 3440m, ru (6247/B) det. B. **Ulu:** Lupanga 1350m, ct (6065 O) det. B; Mwere v. 1400—1600m, li (6160 A) det. B; Lukwangule plateau W 2500m, ru (6084/L) det. B. (Cape, Nat, Tvl, Rho, Ngorongoro, Kil, Ken, Elg, Abe, Ruw.)

**388. *Brachythecium afroglareosum*** (Broth.) Par. — **Kil:** On stone walls of Mandara (Bismarck) hut, 2700m (6242/E) det. B. (Ken, Usb.)

**389. *Brachythecium atrotheca*** (Dub.) Besch. — Submontane forest. **Ulu:** Morningside 1240m, te (6004 Z) det. B; Bondwa N 1500m, te (6303/E) det. B. (Ken, Kil, Usb, Réu.)

**390. *Brachythecium dümmeri*** Dix. (*B. duemmeri* Dix. in Index Muscorum.) — Subalpine bamboo forest. **Por:** Ngozi crater E 2100m, Ba (6330 O) det. B. (Elg, Ken: 4400—4600m.)

**391. *Brachythecium implicatum*** (Hornsch.) Jaeg. — Montane forests. **Ulu:** Bondwa NNE 1550m, te (6006/AE) det. B; Near Rundi village 1610m, ru (6074/J) det. B. (Cape, Nat, Tvl, Rho, Ruw.)

**392. *Brachythecium spectabile*** Broth. — Subalpine *Philippia* heath and *Senecio cottonii* moorland. **Kil:** above Horombo hut 3700—3800m, ru, tu (6248 O, 6249 C) det. B. (Kar, Muh 4100m, Ruw 3500—4500m, Ken 3400—4350m.)

**393. *Brachythecium sticto-patens*** C. Muell. This species seems very closely allied to *B. populeum* (Hedw.) B. S. G. — Montane forests. **Ulu:** W edge of Lukwangule plateau 2040—2400m, ct (6076/BD) det. B. **SHI:** Lupeme Estate near Mufindi 1750m, te (6318 Y) det. B. (Cape, Nat, Kil: 4800m.)

**394. *Rhynchostegium bello-intricatum*** C. Muell. — *Hagenia-Erica* forest. **Kil:** above Mandara hut 2800 ct (6245 Y) det. B. (Cam — new for East Africa.)

**395. *Rhynchostegium volkensii*** (Broth.) Par. — Submontane, montane and subalpine forests. **Kil:** Mweka route 2150m, ct (6344 AC) det. B. **SHI:** Mufindi Scarp F. R. near the Fishing Camp 1730m, ct (6322 L) det. B; on planted *Cupressus* near Mufindi village 1900m, ct (6320 U) det. B. **Por:** Lake Ngozi crater rim 2100m, Ba (6330 L/) det. B. (Zre, Abe, Kil.)

**396. *Rhynchostegiella holstii*** (Broth) Broth. — Submontane forest. **Ulu:** Morningside 1240m, ru (6004 Q) det. B. (Kivu area, Kil, Usb.)

**397. *Oxyrrhynchium praelongum*** (Hedw.) Warnst. — Submontane forests. **Ulu:** Morningside 1250m, ru (6004 D) det. B; Luhungu 1550m, ru (6059/E) det. B; Mkungwe F. R. 800—1000m, ct (6218/C) det. B; Mt. Tumbako SE 1000m, ct (6167 P) det. B. (Cosmopolite, new for tropical Africa.)

**398. *Erythrodonium subulaceum*** C. Muell. — Lowland and submontane forests. **Ulu:** Kimboza F. R. 300m, ru (6054/K) det. B. Mt. Tumbako SE (6189/N) det. B. (Widespread in tropical Africa.)

**399. *Trachyphyllum fabronioides*** (C. Muell.) Gepp. — *Brachystegia* woodland. **Usa:** SW of Mikumi 900m (6312 B) det. B. (Ang, Usb, Rho, Tvl, EAf Islands.)

**400. *Entodon geminidens*** (Besch.) — Submontane forest. **Ulu:** Luhungu 1550m, ru (6059/D) det. B. (Usb, Tvl, Réu.)

**401. *Entodon vulcanicus*** Demaret et Leroy — *Hagenia* forest. **Run:** N slope of Rungwe volcano 2300m, ct (6334/N) det. B. (Zre: Mt. Mikeno in Kivu area 2800m; Abe: Nyeri track 2400m.)

**402. *Stereophyllum radiculosum*** (Hook.) Mitt. — Submontane forests, usually on rocks of stream beds. **Ulu:** Valley behind Morongoro Teachers' Training College 600m, ru (6016 H, K) det. B; Mzinga v. 1450m, ct, ru (6266/M, T) det. B. (Tropical and temperate America, Cam, Gab, Gui. Probably conspecific with the Asian *S. indicum* (Bél.) Mitt.)

**403. *Plagiothecium nitens*** Dix. — Montane and subalpine forests. **Kil:** above Mandara hut, 2800m, ct (6245 U) det. B. **Ulu:** Bondwa top 2000m, te (6011/L) det. B. (Ken, Kil 2700m.)

**404. *Clastrobryella foliicola*** P. de la Varde — Lowland and submontane rain forest. **Ngu:** above Kwamanga village 1100—1400m, ph (6397 AB) det. B. **Ulu:** Kimboza F. R. 300m, ph (6216/K) det. B. (Gab—new for East Africa.)

**405. *Acanthocladium cuynetii*** Bizot — Submontane rain forest. **Ulu:** Mwere v. 1500m, ru (6220/F) det. B. (Cam — new for East Africa.)

**406. *Acanthocladium trichocolea*** (C. Muell.) Broth. — Montane forests. **WUs:** U. F. R. 1800m, ct (6372 BU) det. B. **Ulu:** Lupanga S 1500—1900m, ct (6284 AA, 6285/Y) det. B; Bondwa 2000m, ct (6012/AA) det. B; Luhungu 1600—1800m, ct (6227/C) det. B. (Gab, Rho: Inyanga, Nat, Usb, Kil, Elg.)

**407. *Acanthocladium trichocoleoides*** (C. Muell.) Broth. — Montane forests. **Ulu:** Bondwa N 1700m, ru (6055/K) det. B. **SHI:** Mufindi Scarp. F. R., by the stream below the artificial lake, 1720m, ru (6323/T) det. B. (S—T, Cam — new for East Africa.)

**408. *Heterophyllum flexile*** (Ren. et Card.) Thér. et P. de la Varde — Syn.: *Microthamnium flexile* Ren. et Card., *Acanthocladium fl.* (Ren. et Card.) Broth. — Submontane and montane forests. **EUs:** Amani 900m, Cy (6086/H) det. B. **Ulu:** Kinole sawmill 900—950m, ct (6172 D) det. B; Lupanga WNW 1700—2000m, S 1900—2000m, ct, ra (6071/AO, 6287/B) det. B. **Por:** Ngozi crater rim, 2200—2250m, ct (6329/AB, AG, AL) det. B. (Ruw 2450—2500m, Nyamlagira, Mad.)

**409. *Warburgiella leptorrhyncha*** (Jaeg.) Broth. — Montane and sub-alpine forests. **Kil:** above Mandara hut 2800m, ct (6245 S) det. B. **SHI:** Mufindi Scarp F. R. near the Fishing Camp 1730m, ct (6322 O) det. B. (Tropical Africa.)

**410. *Sematophyllum caespitosum*** (Hedw.) Mitt. — Montane forests. **SHI:** Mufindi Scarp F. R. near the Fishing Camp 1720—1800m, ct (6323/V partly, 6324 H partly) det. B. (Pantropicale.)

**411. *Sematophyllum elgonense*** (Dix.) Broth. — Subalpine forests. **Kil:** Umbwe route 2700m, ct (6194 K) det. B. **Run:** Mt. Rungwe NE 2400m, ct 6327/K det. B. (Ruw 3000m, Elg 3600—3800m, Kil 2700m.)

**412. *Sematophyllum laetevirens*** (Broth. et Par.) Broth. — Montane forests and subalpine heath. **Mer:** Kitoto 2400—2600m, li (6340/R partly) det. B. **Run:** Mt Rungwe N 2300m, NE 2400m (6334/AC, 6328 J) det. B. (Gui, RCA, Mali, Uga: Kisoro.)

**413. *Sematophyllum sinuosulum*** (Besch.) Broth. Submontane and montane forests. **Kas:** E 1250—1400m, ph coll. F (6'2 1971) det. B. **WUs:** U. F. R. 1750—1880m (6372/CH) det. B. **Ulu:** Bondwa 2100m, ct (6309/K) det. B. (Réu — new for continental Africa.)

**414. *Acroporium megasporum*** (Dub.) Fleisch. — Montane mossy forest. **Ulu:** Lupanga SW 1700—1900m, ct (6285/BG) det. B. (Gab, Mas — new for East Africa.)

**415. *Trichosteleum humbertii*** P. de la Varde — Montane and sub-alpine forests. **Kil:** above Mandara hut 2800m, li (6245/X) det. B. **Ulu:** Bondwa E 1700—1900m, li (6260/H partly) det. B. (Kivu: Kahuzi, Abe.)

**416. *Trichosteleum mamillipes*** Broth. — Submontane and montane forests. **Ulu:** Kinazi 1400—1650m, li (6289 AT, AU) det. B. Bondwa NE 1800—2050m, E 1700—1900m, li (6230/H, 6260 H partly) det. B; Mzinga v. 1450m, ct (6266/M) det. B; Mt. Tumbako 1000m, ct, li (6167/A, G,

6167/K) det. B. **Kan:** S 1370m, li (6140/R) det. B. (Gab, Uga: Sese Isls., Usb.)

**417. *Trichosteleum perhamosum*** (C. Muell.) Broth. — Submontane rain forest. **EUs:** Amani 950m, li (6091/B) det. P. (Cam, Gab — new for East Africa.)

**418. *Taxithelium* cf. *subrotundatum*** Broth. et Par. — Lowland rain forest. **Ulu:** Kimboza F. R. 300m, ct (6023 E) det. B. (Gui — new for East Africa.)

**419. *Macrohymenium acicodon*** (Mont.) Dozy et Moelk. — Montane mossy and subalpine elfin forest. **Ulu:** Lupanga NW 1650—2100m, ra (6068/W, 6132 A) det. B. (Mad, Réu, Sey — new for continental Africa.)

**420. *Hypnum aduncoides*** C. Muell. Syn.: *H. zickendrathii* (Broth.) Broth. — Submontane rain forests. **EUs:** Amani 900m, ct (6086/AH) det. B. **Ulu:** Mt. Tumbako SE 950m, li (6172 C) det. B. (Assam, Sikkim, Burma, Mad, Réu, Cape, Nat, Tvl, Ken.)

**421. *Hypnum cupressiforme*** Hedw. — Subalpine *Erica*, *Podocarpus* and elfin forests. **Mer:** Kitoto 2600m, te (6341/AF) det. B. **Kil:** below Mandara hut 2650m, te (6239]F) det. B. **Ulu:** Lukwangule plateau E 2600m, ct (6081/J) det. B. (Cosmopolite, but altimontane in tropical Africa: 2400—4450m.)

**422. *Ectropothecium regulare*** (Brid.) Jaeg. — Montane forests. **Ulu:** Lupanga S 1700—1900m, ph (6285/AC) det. B; Mwere v. 1500m, ru (6175/A, 6220 E) det. B; Bondwa peak 2020—2100m, te (6011/I, 6052/CO, 6403/AB, AC) det. B. (Cam, Gab, Zre, Cape, Nat, East African Islands.)

**423. *Ectropothecium revolutum*** Broth. — Lowland rain forest. **Ulu:** Kimboza Forest Reserve 250m, ru-travertino (6024 A) det. B. (Cam — new for East Africa.)

**424. *Isopterygium m'bangae*** (C. Muell.) Jaeg. — Submontane and montane forests. **Mer:** Malama 1800m, li (6338/W) det. B. **Kil:** Mweka route 2150m, ct (6344/AB) det. B. **Ulu:** Mt. Tumbako SE 900—1000m, li (6189 K) det. B. (Gab, Niam-Niam, Uga: Sese Isls.)

**424. *Isopterygium seligeri*** (Brid.) Dix. Syn.: *Dolichotheca silesiaca* (Selig.) Fleisch. — Subalpine *Hagenia* — *Podocarpus* forest. **Mer:** Kitoto 2450—2600m, li (6340/R partly) det. B. (Temperate Eurasia, NAF and North America. New for tropical Africa.)

**426. *Isopterygium sericifolium*** Dix. — Submontane rain forest. **Ulu:** Mt. Tumbako SE 1000m, ct, li (6167 Q, 6189/L) det. B. (Ruw, Ken.)

**427. *Taxiphyllum gabonense*** Broth. et P. de la Varde — Submontane rain forests. **EUs:** Amani 900m, te (6089/A, C) det. B. **Kan:** S 1370m, li (6140 Q) det. B. **Ulu:** Mt. Tumbako SE 1000m, ct (6167 D) det. B; Msanga falls above Mzinga village 1150m, ru (6110/T) det. B; Mzinga falls 1150m, ru (6265 L) det. B. **Usa:** Mwanihana F. R. near Sanje 300m, ru (6144/U) det. B. — var. ***plagiothecioides*** P. de la Varde **Ulu:** Morningside 1250m, ru (6004/B) det. B. (Gab, RCA, Zre — new for East Africa.)

**428. *Vesicularia galericulata*** (Dub.) Broth. Syn.: *V. sphaerocarpa* (Jaeg.) Broth. — Submontane rain forest. **EUs:** Amani 900m, te (6089 B) det. B. (Europe?, Cape, Nat, Tvl, Gab, Uga, Mad, Mas.)

429. *Vesicularia nigeriana* Broth. et Par. — Submontane rain forest. **EU**s: Amani 900m, li (6091/G) det. B. **Ulu**: Mt. Tumbako 1000m, ct (6167/J) det. B. (Gui, RCA — new for East Africa.)
430. *Mittenothamnium fruticellum* (Mitt.) Card. — Montane mossy forest. **Por**: Lake Ngozi crater rim 2200m, te (6329 AR) det. B. (F—P, E—Zre: Nyamлагira and Nyiragongo volcanoes.)
431. *Mittenothamnium cygnicollum* (Dix.) Wijk et Marg. — Montane forests. **Ulu**: Magari N 1500—1800m, ct (6296/M) det. B; Lukwangule plateau W 2040—2400m, ct (6076 BG) det. B. (Cape, Nat, Tvl, Rho: Inyanga Mts.)
432. *Mittenothamnium brevicuspis* (P. de la Varde) Wijk et Marg. — Montane mossy forests. **Por**: Lake Ngozi crater rim 2200—2250m, ct (6329/AE) det. B. **Run**: Mt. Rungwe 2400m, ct (6327/P) det. B. (Elg: 2100m.)
433. *Mittenothamnium overlaetii* Thér. et Nav. — Montane mossy forests. **Kil**: Umbwe route 2700m, ct (6194 L) det. B. **Run**: Mt. Rungwe N 2300 m, ct (6334 K) det. B. (E—Zre?)
434. *Mittenothamnium pseudoreptans* (C. Muell.) Card Syn.: *M. glabrifolium* (C. Muell.) Card. — Lowland, submontane and montane forests. **Dar es Salaam** area: Pandé F. R. 150m, te (6162 B) det. B. **Ulu**: Lupanga S 1500—1700m, W 1700—1800m, ru (6284 AB, 6126/C) det. B. **Ulu**: Lupanga S 1500—1700m, W 1700—1800m, ru (6284 AB, 6126 C) det. B; Mzinga v. 1450m, ct (6266 U) det. B. **SHI**: Lupeme Estate near Mufindi 1750m, ct (6318 X partly) det. B. (Mer, Kil, Usb, Zre, Rho; common in SAf.)
435. *Mittenothamnium stuhlmannii* (Broth.) Card. — Submontane rain forest. **Ulu**: Mt. Tumbako SE 1000m, (ra 6167 R) det. B. (T. Bukoba.)
436. *Rhacopilopsis trinitensis* (C. Muell.) Britt. — Montane forest. **SHI**: Mufindi Scarp F. R. near Kilima Tea Factory 1900m, ct (6321/G) det. B. (Widespread in tropical America. In Africa: Gab, Ang, RCA, Zre, Uga: Sesse Isls.)
437. *Hylocomium splendens* (Hedw.) B. S. G. — Subalpine *Erica arborea* forest. **Kil**: Umbwe route 2700—2900m, te, li, ru (6194 H, 6788 W) det. P; Mweka route 2600—2900m, te, ct (6718/B) det. P. (Temperate Eurasia, New Zealand, temperate North America, Antilles, Canary Isls, Acores, NAF. In tropical Africa only: Kar, Ruw, Elg, 3500—4100m alt.)
438. *Oligotrichum cavallii* (Negri) G. L. Smith Syn.: *Catharinea cavallii* Negri, *Atrichum cavallii* (Negri) P. de la Varde, *Spoggodera cavallii* (Negri) P. de la Varde et Thér. — Subalpine *Erica arborea* forests. **Kil**: Umbwe route 2450—2900m, te (6193 D, 6788/AD) det. B and P; Mweka route below Mweka Base hut, irrigated, semishaded rocks of Chorongo v. 2985m (6719/D) det. P. (Ruwi: Bujongolo, Mt. Baker and Stanley, Bujuku v., W side, Mijusi v. 3800—4200m; Mt. Mikéno: Camp Ruéru 3100m; Muh: NW 4000m.) The study of the richly developed sporophytes of this interesting afroalpine moss proves the rightness of G. L. Smith's opinion (1971:53) who placed this species in the genus of *Oligotrichum*.

The capsule has 32 compound peristome teeth and about 16 large stomata at its base.

**439. Pogonatum usambaricum** (Broth.) Par. — Montane forests. **Ulu:** Bondwa N 1550m, E 1950m, te (6006/J, 6011/V) det. B; Magari peak 2000—2100m, te (6297/O) det. B. (Usb 950m.)

**440. Pogonatum simense** (C. Muell.) Jaeg. — Montane mossy forest. **Run:** Mt. Rungwe 2300m, te (6334/R) det. B. (Cam, Eth, Elg, Kil 3650m, Nat.)

**441. Polytrichum subformosum** Besch. Probably conspecific with *P. commune* L. ex Hedw. — Montane forests. **Ulu:** Bondwa N 1550—2000m, te (6006/C, 6011/G) det. B. (Vir, K: Limuru, Ulu, East African islands, SAf?, Yunnan?)

## A P E N D I X

Since the publication of our new genus and species *Neorutenbergia armata* Bizot et Pócs, Rev. Bryol. et Lichén. **40** (1974):27 we found this species to be identical with *Rutenbergia usagarae* Dixon, Kew Bull. **6—7** (1919):267, compared with the type (K—BM). Therefore a new combination is proposed: ***Neorutenbergia usagarae*** (Dix.) Bizot. et Pócs.

Our colleague, Dr. D. J. Mabblerley, kindly called our attention to the fact, that a genus called *Jonesia* is already published among phanerogams. Therefore our generic name *Jonesia* Bizot et Pócs is illegitimately published, Rev. Bryol. et Lichén. **40** (1973):25 and we propose a new name for the genus: ***Jonesiobryum*** Bizot et Pócs nom. nov. Syn.: *Jonesia* Bizot et Pócs 1974 non *Jonesia* Roxb. 1841.

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