***NE Skeleton to Freely Branched (mostly pleurocarpous) Mosses***

*Revised through 17 May 2010*

***Reminder****: a dagger* (†) *indicates that not all of the species within the given genus have the character(s) defining that Group.*

***Group P1 – Shoots strongly flattened (complanate) or angular***

Group P1

*Brachelyma* ***Homalia******Neckera***

***Brotherella*** *Homaliadelphus Neckeropsis*

***Callicladium******Hookeria Plagiothecium***†

*Callicostella* ***Isopterygiopsis*** *Porotrichum*

*Cyclodictyon* ***Isopterygium Pseudotaxiphyllum***

***Entodon*†***Lepidopilum Racopilum*

***Fontinalis*† *Leptodictyum*† *Steerecleus***

***Herzogiella***† *Metaneckera* ***Taxiphyllum***

Group P2 – Shoots julaceous (both wet & dry) - shoots round with  
crowded, overlapping & appressed leaves

Group P2

*Antitrichia*†***Leucodon*** *Pterogonium*

***Bryoandersonia******Myurella***† *Scleropodium*†

*Cryphaea**Plagiobryum* ***Scorpidium***

***Entodon***† ***Pseudoscleropodium******Thelia***

***Hedwigia***

Group P3 – Leaves spreading at right angles (squarrose) or squarrose-recurved

Group P3

***Campylium*† *Rhytidiadelphus***

***Group P4 – Plants with erect branches from a creeping stem***

Group P4

***Drummondia*** *Jaegerina Neomacounia*

***Forsstroemia*** *Macrocoma Schlotheimia*

*Groutiella Macromitrium*

Group P5 – Plants with leaves sickle-shaped &  
turned to one side (falcate-secund)

Group P5

***Brachythecium*† *Hypnum Pylaisiadelpha***

***Brotherella Isopterygiopsis Rhytidiadelphus*†**

***Ctenidium Leucodon*** *Rhytidiopsis*

***Dichelyma******Limprichtia******Rhytidium***

***Drepanocladus***† *Loeskypnum*†***Sanionia***

*Gollania* ***Palustriella Scorpidium***

***Hamatocaulis Platygyrium Sematophyllum***

*Heterophyllum* ***Ptilium******Warnstorfia***

***Hygrohypnum*† *Pylaisiella***

***Group P6 – Plants with paraphyllia or tomentum on stem***

Group P6

***Abietinella Helodium Palustriella***

*Alsia* ***Heterocladium***† *Pseudoleskea*

***Bryohaplocladium******Hylocomiastrum******Rauiella***

*Claopodium* ***Hylocomium*** *Rhytidiopsis*

***Climacium*** *Lescuraea* ***Thelia***

***Cratoneuron Leskea (often few paraphyllia) Thuidium***

***Cyrto-hypnum Loeskeobryum******Tomentypnum***

*Dendroalsia Metaneckera*

***Group P7 – Plants with red stems***

Group P7

*Antitrichia* ***Hylocomium*** *Plagiobryum*

***Climacium Hypnum Pleurozium***

***Hedwigia******Loeskeobryum******Rhytidiadelphus***

***Group P8 – Plants with shoots flat on top and appearing “braided”***

Group P8

***Brotherella Hypnum*† *Ptilium***

***Ctenidium***

Group P9 – Leaves undulate or rugose (irregular undulations)

Group P9

*Metaneckera Rhytidiopsis Schlotheimia*†

***Neckera***†***Rhytidium Scorpidium***

Group P10 – Leaves dimorphic (two forms on the same axis)

Group P10

*Hypopterygium Racopilum*

***Group P11 – Leaves with awns, hair-points or hyaline apices***

Group P11

*Braunia* ***Hedwigia Racomitrium*†**

***Cirriphyllum*** *Iwatsukiella Wijkia*

*Claopodium*† *Pseudobraunia* *Zelometeorium*

Group P12 – Plants thread-like (leaves < 1mm)

**Group P12**

***Campylophyllum******Platydictya*** *Pseudoleskeella*

***Homomallium***

***Group P13 – Costa double & >1/3 leaf length***

**Group P13**

*Callicostella* ***Hylocomiastrum***† *Pseudocalliergon*

*Cyclodictyon* ***Hylocomium Rhytidiadelphus***†

***Heterocladium***† *Lepidopilum Trachyxiphium*

***Hygrohypnum***†***Loeskeobryum***

***Group P14 – Costa single & narrow; leaves with distinct decurrencies***

**Group P14**

***Brachythecium*† *Heterocladium*†** *Pleuroziopsis*

***Bryhnia***

***Group P15 – Costa single & narrow; leaves with a distinct marginal border***

Group P15

*Brachelyma* ***Helodium† Platylomella***

*Daltonia Limbella* ***Thelia***

*Groutiella*

***Group P16 – Costa single & narrow; leaves with distinct alar cells***

**Group P16**

***Brachythecium*** *Entodontopsis Palamocladium*

***Calliergon Hygrohypnum Palustriella***

***Campylium*†*****Isothecium Pseudoscleropodium***

***Cratoneuron*** *Loeskypnum* ***Sarmenthypnum***

***Drepanocladus***

***Group P17 – Costa double or none; leaves with distinct decurrencies***

**Group P17**

***Herzogiella*† *Heterocladium*† *Plagiothecium***

***Group P18 – Costa short & double, or none; leaves bordered***

**Group P18**

*Groutiella* ***Thelia***

***Group P19 – Costa short & double, or none; leaves with distinct alar cells***

**Group P19**

*Acroporium Herzogiella*† *Pterogonium*

*Alsia Heterophyllium* ***Ptilium***

***Brotherella Hygrohypnum Pylaisiadelpha***

***Callicladium Hypnum Pylaisiella***

***Calliergonella Isopterygium Rhytidiadelphus*†**

***Campylium*†***Leptopterigynandrum* ***Scorpidium***

*Donnellia* ***Leucodon Sematophyllum***

***Entodon Platygyrium*** *Tripterocladium*

***Forsstroemia Pleurozium*** *Wijkia*

*Gollania*

***Group P20 – Costa of uncommon or variable form***

**Group P20**

*Alsia* ***Hygrohypnum Platyhypnidium***†

*Antitrichia* ***Isothecium*** *Pseudocalliergon*

***Calliergon*** *Jaegerina Pseudoleskeella*†

***Drepanocladus***† *Leptopterigynandrum* ***Pseudoscleropodium***

*Donrichardsia* ***Myurella*† *Taxiphyllum***

***Forsstroemia***† *Neomacounia* ***Thelia*†**

***Heterocladium*† *Plagiothecium***

***Note****: In the following Groups, all possible genera are listed to give perspective on the Freely branched mosses. Only the genera* ***NOT in brackets [--]*** *are keyed out in Groups P21-P28; the genera in brackets should be identifiable using the criteria characteristic of the previous Groups.*

***Reminder****: Definitions for cell length to breadth ratios are found in the Introduction, the Overview & at the end of this section.*

***Group P21 – Cells long (>8:1); distinctly papillose or prorulose***

**Group P21**

***Bryhnia***† ***Chryso-hypnum*** *Homalothecium*†

*[Hylocomium] [Rhytidium] [Taxiphyllum]*

*[Rhytidiadelphus]*

***Group P22 – Cells long; smooth or indistinctly ornamented#;  
costa single (long & narrow)***

**Group P22**

***Brachythecium***†***Homalotheciella*** *Scleropodium*

***Conardia Homalothecium*† *Steerecleus***

***Dichelyma Leptodictyum*†** *Trachybryum*

***Eurhynchium Platyhypnidium***

*[Bryoandersonia] [Entodontopsis] [Pleuroziopsis]*

*[Calliergon] [Hamatocaulis] [Pseudoscleropodium]*

*[Campylium] [Hygrohypnum] [Sanionia]*

*[Cirriphyllum [Limbella] [Sarmenthypnum]*

*[Drepanocladus [Limprichtia] [Warnstorfia]*

*[Entodon] [Loeskypnum]*

\*: Cells indistinctly papillose, i.e., low papillae, or prorulose.

***Group P23 – Cells long; smooth or indistinctly ornamented#;  
costa double (long or short) or none***

**Group P23**

**Costa long** & **double**

***Loeskeobryum***

*[Hylocomiastrum] [Rhytidiadelphus] [Trachyxiphium]*

**Costa short** & **double**, or **none**

***Fontinalis*** *Orthothecium*

*[Brotherella] [Hylocomium] [Ptilium]*

*[Callicladium] [Hypnum] [Pylaisiadelpha]*

*[Calliergonella] [Isopterygiopsis] [Rhytidiadelphus]*

*[Campylium] [Isopterygium] [Rhytidiopsis]*

*[Gollania] [Plagiothecium] [Scorpidium]*

*[Herzogiella] [Pleurozium] [Sematophyllum]*

*[Hygrohypnum] [Pseudotaxiphyllum] [Taxiphyllum]*

***Group P24 – Cells intermediate (3-8:1); distinctly papillose or prorulose***

**Group P24**

**Papillose**

*Barbella Papillaria Taxithelium*

*Henicodium*

*[Antitrichia] [Helodium]*

**Prorulose**

*Leptohymenium Pireella* ***Pterigynandrum***

*Lescuraea*†

*[Bryhnia] [Hylocomium] [Pterogonium]*

*[Ctenidium] [Isothecium] [Rhytidiadelphus]*

*[Dendroalsia] [Porotrichum] [Rhytidium]*

*[Helodium]*

***Group P25 – Cells intermediate; smooth or indistinctly ornamented#;***

***costa single (wide or narrow)***

**Group P25**

**Costa wide**

*[Donrichardsia]*

**Costa narrow**

***Amblystegium*† *Eurhynchium*** *Pireella*

***Anacamptodon*** *Fabronia Pseudocryphaea*

*Bestia* ***Hygroamblystegium***†***Sarmenthypnum***

***Brachythecium*† *Leptodictyum***† *Scleropodium*

***Dichelyma*** *Myuroclada Trachybryum*

*[Brachelyma] [Forsstroemia] [Palustriella]*

*[Calliergon] [Hamatocaulis] [Porotrichum]*

*[Campylium] [Homalia] [Pseudoleskeella]*

*[Climacium] [Hygrohypnum] [Sanionia]*

*[Conardia] [Jaegerina] [Tomentypnum]*

*[Cratoneuron] [Limprichtia] [Warnstorfia]*

*[Daltonia] [Metaneckera] [Wijkia]*

*[Drepanocladus] [Palamocladium] [Zelometeorium]*

***Group P26 – Cells intermediate; smooth or indistinctly ornamented\*;  
costa double (long or short) or none***

**Group P26**

**Costa long** & **double**

*[Heterocladium*†*] [Hylocomiastrum]*

**Costa short** & **double**, or **none**

*Acroporium**Iwatsukiella**Pseudocalliergon*

*Bryocrumia**Orthothecium**Vesicularia*

***Fontinalis***

*[Alsia] [Homomallium] [Platygyrium]*

*[Campylium] [Hygrohypnum] [Pseudoleskeella]*

*[Campylophyllum] [Hypnum] [Pylaisiella]*

*[Donnellia] [Neckera] [Rhytidiadelphus]*

*[Entodon] [Neomacounia] [Sematophyllum]*

*[Forsstroemia] [Plagiothecium] [Tripterocladium]*

*[Heterocladium*†*] [Platydictya] [Zelometeorium]*

*[Heterophyllium]*

**Group P27**

**Papillose**

***Anomodon Heterocladium*† *Racomitrium***

*Braunia Leskea Stereophyllum*†

***Haplohymenium Lindbergia***†

*[Abietinella] [Cyclodictyon]*  *[Pseudoleskea]*

*[Hedwigia] [Cyrto-hypnum] [Rauiella]*

*[Bryohaplocladium] [Leptopterigynandrum] [Thelia]*

*[Callicostella] [Pseudobraunia] [Thuidium]*

*[Claopodium]*

**Prorulose**

***Heterocladium***† *Schwetschkeopsis*

*[Dendroalsia] [Porotrichum]*

***Group P28 – Cells short; smooth or indistinctly ornamented#***

**Group P28**

**Costa single**, **long** & **narrow**.

***Amblystegium***† ***Hygroamblystegium***† *Myrinia*

*Clasmatodon* *Leptodon* *Plagiobryum*

***Cryphaea***† ***Leskeella*** ***Racomitrium***

*Herpetineuron* ***Lindbergia***† *Stereophyllum*

*[Forsstroemia] [Macrocoma] [Porotrichum]*

*[Groutiella] [Macromitrium] [Pseudoleskeella]*

*[Heterocladium*†*] [Myurella] [Racopilum]*

*[Hypopterygium] [Neckeropsis] [Schlotheimia]*

*[Isothecium] [Platylomella] [Thamnobryum]*

**Costa short** & **double**, or **none**.

*Iwatsukiella* *Stereophyllum* *Vesicularia*

*[Donnellia] [Homaliadelphus] [Neckeropsis]*

*[Drummondia] [Hookeria] [Platydictya]*

*[Forsstroemia] [Lepidopilum] [Pseudoleskeella]*

*[Heterocladium*†*]**[Leucodon] [Sematophyllum]*

Length to breadth ratios of medial, laminal cells:

Long cells:  **>8:1**: commonly termed linear or linear-flexuose.

Intermediate cells:  **3-8:1**; commonly termed elongated, oblong-rhomboidal, fusiform., or elliptical.

Short cells: **<3:1**: commonly termed isodiametric, quadrate, rounded-quadrate or rhombic.

\*: Cells indistinctly papillose, i.e., low papillae, or prorulose.

End.