***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.