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

*Revised through 23 July 2012*

***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 Homaliadelphus Neckera*

 *Brotherella Hookeria Neckeropsis*

 *Callicladium Hypopterygium Plagiothecium*†

 *Callicostella Isopterygiopsis Porotrichum*

 *Cyclodictyon Isopterygium Pseudotaxiphyllum*

 *Entodon*† *Lepidopilum Racopilum*

 *Fontinalis*† *Leptodictyum*† *Steerecleus*

 *Herzogiella*† *Metaneckera Taxiphyllum*

 *Homalia*

Group P2 – Shoots julaceous (especially when dry) - shoots round with
crowded, overlapping and appressed leaves

 Group P2

 *Antitrichia*† *Leptopterigynandrum Pterogonium*

 *Bryoandersonia Leucodon*† *Scleropodium*†

 *Cryphaea Myurella*† *Scorpidium*

 *Entodon*† *Plagiobryum Thelia*

 *Hedwigia Pseudoscleropodium*

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

 *Bestia Groutiella Macromitrium*

 *Drummondia Jaegerina Neomacounia*

 *Forsstroemia Macrocoma Schlotheimia*

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

 Group P5

 *Brachythecium*† *Heterophyllum Ptilium*

 *Brotherella Hygrohypnum*† *Pylaisiadelpha*

 *Ctenidium Hypnum Rhytidium*

 *Dichelyma Limprichtia Sanionia*

 *Drepanocladus*† *Loeskypnum*† *Scorpidium*

 *Gollania Palustriella Warnstorfia*

 *Hamatocaulis*

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

 Group P6

 *Abietinella Helodium Pseudoleskea*

 *Alsia Hylocomiastrum Rauiella*

 *Climacium Hylocomium Rhytidiopsis*

 *Cratoneuron Lescuraea Thelia*

 *Cyrto-hypnum Loeskeobryum Thuidium*

 *Dendroalsia Metaneckera Tomentypnum*

 *Haplocladium Palustriella*

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

 Group P7

 *Antitrichia Hedwigia Loeskeobryum*

 *Calliergonella Hylocomiastrum Plagiobryum*

 *Climacium Hylocomium Pleurozium*

 *Dendroalsia Hypnum 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 Iwatsukiella Racomitrium*†

 *Cirriphyllum Pseudobraunia Wijkia*

 *Claopodium*† *Pseudoleskea*† *Zelometeorium*

 *Hedwigia*

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

 **Group P12**

 *Homomallium Platydictya Pseudoleskeella*

***Group P13 – Costa double and more than 1/3 leaf length***

 **Group P13**

 *Callicostella Hylocomiastrum*† *Plagiothecium*†

 *Cyclodictyon Hylocomium Pseudocalliergon*

 *Heterocladium*† *Lepidopilum Rhytidiadelphus*†

 *Hygrohypnum*† *Loeskeobryum Trachyxiphium*

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

 **Group P14**

 *Anomodon*† *Calliergon*† *Hygrohypnum*†

 *Brachythecium*† *Eurhynchium*† *Pleuroziopsis*

 *Bryhnia Heterocladium*†

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

 Group P15

 *Brachelyma Helodium† Platylomella*

 *Daltonia Hypopterygium Thelia*

 *Groutiella Limbella*

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

 **Group P16**

 *Bestia Forsstroemia*† *Palamocladium*

 *Brachythecium Hygrohypnum*† *Palustriella*

 *Calliergon Isothecium Pseudoleskeella*†

 *Campylium*† *Leptopterigynandrum Pseudoscleropodium*

 *Clasmatodon Lescuraea Rhytidium*

 *Cratoneuron Leskeella Sarmenthypnum*

 *Drepanocladus Lindbergia Stereophyllum*

 *Entodontopsis Loeskypnum*

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

 **Group P17**

 *Herzogiella*† *Hygrohypnum*† *Plagiothecium*

 *Heterocladium*†

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

 **Group P18**

 *Groutiella Thelia*

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

 **Group P19**

 *Acroporium Heterophyllium Pterogonium*

 *Alsia Homomallium Ptilium*

 *Brotherella Hygrohypnum Pylaisiadelpha*

 *Callicladium Hypnum Pylaisiella*

 *Calliergonella Isopterygium Rhytidiadelphus*†

 *Campylium*† *Leptopterigynandrum Scorpidium*

 *Donnellia Leucodon Sematophyllum*

 *Entodon Platygyrium Taxiphyllum*†

 *Forsstroemia*† *Pleurozium Tripterocladium*

 *Gollania Pseudoleskeella*† *Wijkia*

 *Herzogiella*†

***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 and 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]*

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

 **Group P22**

 *Brachythecium*† *Homalotheciella Scleropodium*†

 *Conardia Homalothecium*† *Steerecleus*

 *Dichelyma Leptodictyum*† *Stereophyllum*†

 *Eurhynchium Platyhypnidium Trachybryum*

 *[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 projections.

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

 **Group P23**

**Costa long** and **double**

 *Loeskeobryum*

 *[Hylocomiastrum] [Rhytidiadelphus] [Trachyxiphium]*

**Costa short** and **double**, or **none**

 *Fontinalis Isopterygium Pseudotaxiphyllum*

 *Herzogiella Orthothecium Taxiphyllum*

 *Isopterygiopsis*

 *[Brotherella] [Hylocomium] [Pylaisiadelpha]*

 *[Callicladium] [Hypnum] [Rhytidiadelphus]*

 *[Calliergonella] [Plagiothecium] [Rhytidiopsis]*

 *[Campylium] [Pleurozium] [Scorpidium]*

 *[Gollania] [Ptilium] [Sematophyllum]*

 *[Hygrohypnum]*

 # Cells indistinctly papillose, i.e., low papillae or projections.

***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*† *Fabronia* *Pireella*

 *Anacamptodon Hygroamblystegium*† *Pseudocryphaea*

 *Brachythecium*† *Leptodictyum*† *Sarmenthypnum*

 *Dichelyma Lescuraea Scleropodium*

 *Eurhynchium Myuroclada Trachybryum*

 *[Brachelyma] [Hamatocaulis] [Palustriella]*

 *[Calliergon] [Helodium] [Plagiobryum]*

 *[Campylium] [Homalia] [Porotrichum]*

 *[Climacium] [Hygrohypnum] [Sanionia]*

 *[Conardia] [Jaegerina] [Tomentypnum]*

 *[Cratoneuron] [Limprichtia] [Warnstorfia]*

 *[Daltonia] [Metaneckera] [Wijkia]*

 *[Drepanocladus] [Palamocladium] [Zelometeorium]*

 *[Forsstroemia]*

 # Cells indistinctly papillose, i.e., low papillae or projections.

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

 **Group P26**

**Costa long** and **double**

 *Heterocladium*† *[Hylocomiastrum]*

**Costa short** and **double**, or **none**

*Acroporium**Iwatsukiella**Pseudocalliergon*

*Bryocrumia**Orthothecium**Vesicularia*

*Fontinalis*

 *[Alsia] [Homomallium] [Platydictya]*

 *[Campylium] [Hygrohypnum] [Platygyrium]*

 *[Donnellia] [Hypnum] [Pylaisiella]*

 *[Entodon] [Neckera] [Sematophyllum]*

 *[Forsstroemia] [Neomacounia] [Tripterocladium]*

 *[Heterocladium] [Plagiothecium] [Zelometeorium]*

 *[Heterophyllium]*

 # Cells indistinctly papillose, i.e., low papillae or projections.

***Group P27 – Cells short (<3:1); distinctly papillose or prorulose***

 **Group P27**

**Papillose**

 *Anomodon Haplohymenium Myurella*†

 *Braunia Heterocladium*† *Pseudoleskea*†

 *Claopodium Leskea*† *Racomitrium*

 *Haplocladium Lindbergia*†

 *[Abietinella] [Cyclodictyon] [Rauiella]*

 *[Hedwigia] [Cyrto-hypnum] [Thelia]*

 *[Callicostella] [Pseudobraunia] [Thuidium]*

**Prorulose**

 *Heterocladium*† *Schwetschkeopsis*

 *[Dendroalsia] [Porotrichum]*

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

 **Group P28**

**Costa single**, **long** and **narrow**.

 *Amblystegium*† *Hygroamblystegium*† *Myrinia*

 *Bestia Leptodon Pseudoleskea*†

 *Clasmatodon* *Leskea*† *Pseudoleskeella*

 *Cryphaea*† *Leskeella* *Racomitrium*

 *Herpetineuron Lindbergia*† *Stereophyllum*

 *[Forsstroemia] [Leptopterigynandrum] [Porotrichum]*

 *[Groutiella] [Macrocoma] [Racopilum]*

 *[Heterocladium] [Macromitrium] [Schlotheimia]*

 *[Hypopterygium] [Neckeropsis] [Thamnobryum]*

 *[Isothecium] [Platylomella]*

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

 *Iwatsukiella* *Pseudoleskeella* *Vesicularia*

 *Myurella*†

 *[Donnellia] [Hookeria] [Neckeropsis]*

 *[Drummondia] [Lepidopilum] [Platydictya]*

 *[Forsstroemia] [Leptopterigynandrum] [Sematophyllum]*

 *[Homaliadelphus]**[Leucodon]*

 # Cells indistinctly papillose, i.e., low papillae or projections.

 **Cells** = medial, laminal cells; cells ~2/3 of the way from insertion to apex, midway between the costa and the margin.

 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.

End.