

NE Skeleton to Freely Branched (mostly pleurocarpous) Mosses

Revised through 12 January 2009

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

<i>Brachelyma</i>	<i>Homalia</i>	<i>Neckera</i>
<i>Brotherella</i>	<i>Homaliadelphus</i>	<i>Neckeropsis</i>
<i>Callicladium</i>	<i>Hookeria</i>	<i>Plagiothecium</i> †
<i>Callicostella</i>	<i>Isopterygiopsis</i>	<i>Porotrichum</i>
<i>Cyclodictyon</i>	<i>Isopterygium</i>	<i>Pseudotaxiphyllum</i>
<i>Entodon</i> †	<i>Lepidopilum</i>	<i>Racopilum</i>
<i>Fontinalis</i> †	<i>Leptodictyum</i> †	<i>Stereocleus</i>
<i>Herzogiella</i> †	<i>Metaneckera</i>	<i>Taxiphyllum</i>

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

Group P2

<i>Antitrichia</i> †	<i>Hedwigia</i>	<i>Pterogonium</i>
<i>Bryoandersonia</i>	<i>Myurella</i> †	<i>Scleropodium</i> †
<i>Cryphaea</i>	<i>Plagiobryum</i>	<i>Scorpidium</i>
<i>Entodon</i> †	<i>Pseudoscleropodium</i>	<i>Thelia</i>

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

Group P3

<i>Campylium</i> †	<i>Rhytidiadelphus</i>
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Group P4 – Plants with erect branches from a creeping stem

Group P4

<i>Drummondia</i>	<i>Jaegerina</i>	<i>Neomacounia</i>
<i>Forsstroemia</i>	<i>Macrocoma</i>	<i>Schlotheimia</i>
<i>Groutiella</i>	<i>Macromitrium</i>	

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

Group P5

<i>Brachythecium</i> †	<i>Hypnum</i>	<i>Pylaisiadelpha</i>
<i>Brotherella</i>	<i>Isopterygiopsis</i>	<i>Rhytidiadelphus</i> †
<i>Ctenidium</i>	<i>Leucodon</i>	<i>Rhytidiopsis</i>
<i>Dichelyma</i>	<i>Limprichtia</i>	<i>Rhytidium</i>
<i>Drepanocladus</i> †	<i>Loeskypnum</i> †	<i>Sanionia</i>
<i>Gollania</i>	<i>Palustriella</i>	<i>Scorpidium</i>
<i>Hamatocaulis</i>	<i>Platygyrium</i>	<i>Sematophyllum</i>
<i>Heterophyllum</i>	<i>Ptilium</i>	<i>Warnstorfia</i>
<i>Hygrohypnum</i> †	<i>Pylaisiella</i>	

Group P6 – Plants with paraphyllia or tomentum on stem

<i>Abietinella</i>	<i>Helodium</i>	<i>Palustriella</i>	Group P6
<i>Alsia</i>	<i>Heterocladium</i> [†]	<i>Pseudoleskea</i>	
<i>Bryohaplocladium</i>	<i>Hylocomiastrum</i>	<i>Rauyiella</i>	
<i>Claopodium</i>	<i>Hylocomium</i>	<i>Rhytidiopsis</i>	
<i>Climacium</i>	<i>Lescuraea</i>	<i>Thelia</i>	
<i>Cratoneuron</i>	<i>Leskea (often few paraphyllia)</i>	<i>Thuidium</i>	
<i>Cyrto-hypnum</i>	<i>Loeskeobryum</i>	<i>Tomentypnum</i>	
<i>Dendroalsia</i>	<i>Metaneckera</i>		

Group P7 – Plants with red stems

<i>Antitrichia</i>	<i>Hylocomium</i>	<i>Plagiobryum</i>	Group P7
<i>Climacium</i>	<i>Hypnum</i>	<i>Pleurozium</i>	
<i>Hedwigia</i>	<i>Loeskeobryum</i>	<i>Rhytidiadelphus</i>	

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

<i>Brotherella</i>	<i>Hypnum</i> [†]	<i>Ptilium</i>	Group P8
<i>Ctenidium</i>			

Group P9 – Leaves undulate or rugose (irregular undulations)

<i>Metaneckera</i>	<i>Rhytidiopsis</i>	<i>Schlotheimia</i> [†]	Group P9
<i>Neckera</i> [†]	<i>Rhytidium</i>	<i>Scorpidium</i>	

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

<i>Hypopterygium</i>	<i>Racopilum</i>		Group P10
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Group P11 – Leaves with awns, hair-points or hyaline apices

<i>Braunia</i>	<i>Hedwigia</i>	<i>Racomitrium</i> [†]	Group P11
<i>Cirriphyllum</i>	<i>Iwatsukiella</i>	<i>Wijkia</i>	
<i>Claopodium</i> [†]	<i>Pseudobraunia</i>	<i>Zelometeorium</i>	

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

<i>Homomallium</i>	<i>Platydictya</i>	<i>Pseudoleskeella</i>	Group P12
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Group P13 – Costa double & >1/3 leaf length

<i>Callicostella</i>	<i>Hylocomiastrum</i> [†]	<i>Pseudocalliergon</i>	Group P13
<i>Cyclodictyon</i>	<i>Hylocomium</i>	<i>Rhytidiadelphus</i> [†]	
<i>Heterocladium</i> [†]	<i>Lepidopilum</i>	<i>Trachyxiphium</i>	
<i>Hygrohypnum</i> [†]	<i>Loeskeobryum</i>		

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

Group P14

Brachythecium[†]
Bryhnia

Heterocladium[†]

Pleuroziopsis

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

Group P15

Brachelyma
Daltonia
Groustiella

Helodium[†]
Limbella

Platylomella
Thelia

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

Group P16

Brachythecium
Calliergon
Campylium[†]
Cratoneuron
Drepanocladus

Entodontopsis
Hygrohypnum
Isothecium
Loeskypnum

Palamocladium
Palustriella
Pseudoscleropodium
Sarmenthypnum

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

Groustiella

Thelia

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

Group P19

Acroporium
Alsia
Brotherella
Callicladium
Calliergonella
Campylium[†]
Donnellia
Entodon
Forsstroemia
Gollania

Herzogiella[†]
Heterophyllum
Hygrohypnum
Hypnum
Isopterygium
Leptopterigynandrum
Leucodon
Platygyrium
Pleurozium

Pterogonium
Ptilium
Pylaisiadelpha
Pylaisiella
Rhytidiadelphus[†]
Scorpidium
Sematophyllum
Tripterocladium
Wijkia

Group P20 – Costa of uncommon or variable form

		Group P20
<i>Alsia</i>	<i>Hygrohypnum</i>	<i>Platyhypnidium</i> [†]
<i>Antitrichia</i>	<i>Isothecium</i>	<i>Pseudocalliergon</i>
<i>Calliergon</i>	<i>Jaegerina</i>	<i>Pseudoleskeella</i> [†]
<i>Drepanocladus</i> [†]	<i>Leptopterigynandrum</i>	<i>Pseudoscleropodium</i>
<i>Donrichardsia</i>	<i>Myurella</i> [†]	<i>Taxiphyllum</i>
<i>Forsstroemia</i> [†]	<i>Neomacounia</i>	<i>Thelia</i> [†]
<i>Heterocladium</i> [†]	<i>Plagiothecium</i>	

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
<i>Chryso-hypnum</i>	<i>Homalothecium</i> [†]	
[<i>Hylocomium</i>]	[<i>Rhytidium</i>]	[<i>Taxiphyllum</i>]
[<i>Rhytidiadelphus</i>]		

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

		Group P22
<i>Brachythecium</i> [†]	<i>Homalotheciella</i>	<i>Scleropodium</i>
<i>Conardia</i>	<i>Homalothecium</i> [†]	<i>Stereocleus</i>
<i>Dichelyma</i>	<i>Leptodictyum</i> [†]	<i>Trachybryum</i>
<i>Eurhynchium</i>	<i>Platyhypnidium</i>	
[<i>Bryoandersonia</i>]	[<i>Entodontopsis</i>]	[<i>Pleuroziopsis</i>]
[<i>Calliergon</i>]	[<i>Hamatocaulis</i>]	[<i>Pseudoscleropodium</i>]
[<i>Campylium</i>]	[<i>Hygrohypnum</i>]	[<i>Sanionia</i>]
[<i>Cirriphyllum</i>]	[<i>Limbella</i>]	[<i>Sarmenthypnum</i>]
[<i>Drepanocladus</i>]	[<i>Limprichtia</i>]	[<i>Warnstorfia</i>]
[<i>Entodon</i>]	[<i>Loeskypnum</i>]	

*: 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*][*Trachyiphium*]**Costa short & double, or none***Fontinalis**Orthothecium*[*Brotherella*][*Hylocomium*][*Ptilium*][*Callicladium*][*Hypnum*][*Pylaisiadelphus*][*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**Pirella**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*[†]*Anacamptodon**Bestia**Brachythecium*[†]*Dichelyma**[Brachelyma]**[Calliargon]**[Campylium]**[Climacium]**[Conardia]**[Cratoneuron]**[Daltonia]**[Drepanocladus]**Eurhynchium**Fabronia**Hygroamblystegium*[†]*Leptodictyum*[†]*Myuroclada**[Forsstroemia]**[Hamatocaulis]**[Homalia]**[Hygrohypnum]**[Jaegerina]**[Limprichtia]**[Metaneckera]**[Palamocladium]**Pireella**Pseudocryphaea**Sarmenthyppnum**Scleropodium**Trachybryum**[Palustriella]**[Porotrichum]**[Pseudoleskeella]**[Sanionia]**[Tomentypnum]**[Warnstorfia]**[Wijkia]**[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**Bryocrumia**Fontinalis**[Alsia]**[Campylium]**[Donnellia]**[Entodon]**[Forsstroemia]**[Heterocladium*[†]]*[Heterophyllum]**Iwatsukiella**Orthothecium**[Homomallium]**[Hygrohypnum]**[Hypnum]**[Neckera]**[Neomacounia]**[Plagiothecium]**[Platydictya]**Pseudocalliargon**Vesicularia**[Platygyrium]**[Pseudoleskeella]**[Pylaisiella]**[Rhytidiadelphus]**[Sematophyllum]**[Tripterocladium]**[Zelometeorium]*

Group P27

Papillose

*Anomodon**Braunia**Haplohymenium*[*Abietinella*][*Hedwigia*][*Bryohaplocladium*][*Callicostella*][*Claopodium*]*Heterocladium*[†]*Leskea**Lindbergia*[†][*Cyclodictyon*][*Cyrto-hypnum*][*Leptopterigynandrum*][*Pseudobraunia*]*Racomitrium**Stereophyllum*[†][*Pseudoleskea*][*Raiiella*][*Thelia*][*Thuidium*]

Prorulose

Heterocladium[†][*Dendroalsia*]*Schwetschkeopsis*[*Porotrichum*]Group P28 – Cells short; smooth or indistinctly ornamented[#]

Group P28

Costa single, long & narrow.

Amblystegium[†]*Clasmatodon**Cryphaea*[†]*Herpetineuron*[*Forsstroemia*][*Groutiella*][*Heterocladium*[†]][*Hypopterygium*][*Isothecium*]*Hygroamblystegium*[†]*Leptodon**Leskeella**Lindbergia*[†][*Macrocoma*][*Macromitrium*][*Myurella*][*Neckeropsis*][*Platylomella*]*Myrinia**Plagiobryum**Racomitrium**Stereophyllum*[*Porotrichum*][*Pseudoleskeella*][*Racopilum*][*Schlotheimia*][*Thamnobryum*]

Costa short & double, or none.

Iwatsukiella[*Donnellia*][*Drummondia*][*Forsstroemia*][*Heterocladium*[†]]*Stereophyllum*[*Homaliadelphus*][*Hookeria*][*Lepidopilum*][*Leucodon*]*Vesicularia*[*Neckeropsis*][*Platydictya*][*Pseudoleskeella*][*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.