

Overview

Revised through 18 December 2006

Initial Groups ("naked-eye" characters)

- Plants essentially **leafless**, consisting of strongly **inclined**, highly **asymmetric** capsules on a stout **papillose** seta; the "**bug-on-a-stick**" mosses; WS* *Buxbaumia*
- Plants scattered on a bed of abundant, **persistent protonemata**; plants & leaves small to **minute**. Group A
- Plants small to **minute** (mostly <5 mm high) with **±immersed** capsules growing on bare **soil**, usually as winter **annuals**; the "**pygmy ephemerals**" as defined here. Group B
- Plants **rosulate** (leaves in a tight rosette at stem apex) and **large** (diameter 1-2 cm); WS *Rhodobryum*
- Plants erect with clusters of branches (**fascicles**) along the stem & at the apex (**capitulum**); WS *Sphagnum*[†]
- [†] *In part, i.e., not all of the species within this genus will key to this Group. The other species will key to an appropriate Group.*
- Plants from an erect, unbranched **stipe**, and either **dendroid** (tree-like) or **frondose** (fern-like). Group C
- Note - the several mostly prostrate "fern-mosses" lacking a stipe are NOT included here, but will be found in the pleurocarpous Groups below.*
- Plants with **pendulous** branches hanging loosely from tree branches. Group D
- Plants projecting **horizontally** or hanging as "**fish-hooks**" (J-shaped) from vertical surfaces. Group E
- Plants growing on **dung**, decaying animal matter, or other highly nitrogenous materials; the "**dung mosses**". Group F
- Plants **lacking** any of the above unique "growth forms"; Continued below at left margin.
- Plants **freely branched**, i.e., with leafy stems & branches; usually prostrate in wefts or mats. Mostly pleurocarpous or cladocarpous mosses, but also including an occasional acrocarpous moss, e.g., *Plagiobryum*, *Racomitrium*, *Schlotheimia* & etc. Groups P1 on
- Plants **rarely branched**, i.e., lacking obvious branching; usually erect in tufts, cushions or turfs. Mostly acrocarpous mosses, but also including an occasional pleurocarpous or cladocarpous moss, e.g., *Hedwigia*. Groups A1 on

Freely Branched (mostly pleurocarpous) Mosses

Plant Characters Section (naked eye)

Plants strongly flattened (complanate) or angular .	Group P1
Plants julaceous both wet & dry (shoots round; leaves crowded, overlapping, and appressed).#	Group P2
Leaves spreading at right angles (squarrose) or squarrose-recurved; leaf tips often channeled .	Group P3
Plants with erect branches from a creeping stem.	Group P4
Plants with leaves sickle-shaped and turned to one side (falcate-secund).	Group P5
Plants or leaves lacking any of the above unique characters; Continued below at left margin.	

Note - many other taxa have leaves crowded & appressed when dry, but spreading when wet.

Leaf and Stem Characters Section (hand lens)

Plants with paraphyllia or tomentum on stems.	Group P6
Plants with red stems.	Group P7
Plants appearing " braided " (shoots flat on top & bilaterally symmetric; leaves falcate-secund).	Group P8
Leaves undulate or rugose (irregular undulations).	Group P9
Leaves dimorphic (2 different forms [size and/or shape] on the same axis).#	Group P10
Leaves with awns or hair points .	Group P11
Plants thread-like (stems little branched; leaves <1 mm).	Group P12
Plants or leaves lacking any of the above unique characters; Continued below at left margin.	

Note - many other taxa have stem leaves differing from branch leaves.

Costa Characters Section (dissecting scope)

Costa double & more than 1/3 leaf length.	Group P13
Costa single & narrow .	
Leaves with distinct decurrencies .	Group P14
Leaves with a distinct marginal border .	Group P15
Leaves with distinct alar cells .	Group P16

Costa short & double , or none .	
Leaves with distinct decurrencies .	Group P17
Leaves with a distinct marginal border .	Group P18
Leaves with distinct alar cells .	Group P19
Costa of uncommon or variable form (very wide ; Y-shaped ; forked ; or with lateral spurs or supplementary costae).	Group P20
Costa neither double nor of an uncommon form; leaves lacking any of the above unique characters; Continued below at left margin.	

Leaf Cell Ratio Section (compound microscope)

Leaf cells long (>8:1).	
Cells distinctly papillose or prorulose .	Group P21
Cells smooth or indistinctly ornamented.#	
Costa single .	Group P22
Costa double (long or short), or none .	Group P23
Leaf cells intermediate (3-8:1).	
Cells distinctly papillose or prorulose .	Group P24
Cells smooth or indistinctly ornamented.#	
Costa single (narrow or wide).	Group P25
Costa double (long or short), or none .	Group P26
Leaf cells short (<3:1).	
Cells distinctly papillose or prorulose .	Group P27
Cells smooth or indistinctly ornamented.#	Group P28

Note - cells indistinctly papillose, i.e., low papillae or projections. An expanded explanation of the difference between "Distinct" and "Indistinct" surface ornamentation is found in the Introduction.

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

Cell length to breadth **ratio**:

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.

Rarely Branched (mostly acrocarpous) Mosses

"Naked-eye" Characters

Shoots flattened or angular (2-5 ranked) in cross-section, i.e., not round.	Group A1
Shoots julaceous both wet and dry (catkin-like; leaves crowded, overlapping and appressed). [#]	Group A2
Stems tomentose (densely covered by rhizoidal tomentum to near the apex).	Group A3
Stems red .	Group A4
Leaves squarrose-recurved (spreading at right angles with down-turned tips; shoots brush-like).	Group A5
Leaves falcate-secund (sickle-shaped & turned to one side; shoots broom-like).	Group A6
Leaves subulate-setaceous (awl, bristle, or needle-like; length to breadth 8:1 or greater).	Group A7
Shoots, stems or leaves lacking any of the above unique characters; Continued below at left margin.	

[#] *Note* - many species have leaves crowded and appressed when dry, but spreading when wet.

"Hand-lens" Characters

Leaves finger-like and irregularly inserted; NW.	<i>Takakia</i>
Leaves dimorphic (2 different forms [size and/or shape] on the same axis).	Group A8
Leaves with a distinct hyaline hair-point or awn on vegetative leaves. [#]	Group A9
Leaves with lamellae , ridges , or filaments on their laminae or costae.	Group A10
Leaves undulate (distinct transverse waves or ridges).	Group A11
Leaves involute (margins distinctly incurved, inrolled, spirally inrolled or inflexed).	Group A12
Leaves lacking any of the above unique characters; Continued below at left margin.	

[#] *Note* - some species have these hair-points only on the upper leaves; species with hair-points on perichaetial leaves only will be found in other Groups.

"Dissecting microscope" Characters

Leaves \pm all costa , lacking laminae; multistratose.	Group A13
Leaves with a broad, single costa (>1/3 the leaf width).	Group A14
Leaves with a narrow, single costa. Leaves with bases distinctly incurved to expanded & sheathing .	Group A15
Leaves with long, pronounced decurencies .	Group A16
Leaves with a defined group of hyaline cells that stand in distinct contrast to densely papillose or chlorophyllose cells.	Group A17
Leaves with distinct marginal border of differentiated cells (ciliate; cells long, short, pale, hyaline, or thick-walled).	Group A18
Leaves with distinctly differentiated alar cells (cells enlarged, inflated, quadrate, thick-walled, or colored).	Group A19
Leaves with costae extremely reduced to lacking .	Group A20
Leaves lacking any of the above unique characters; Continued below at left margin.	

"Compound microscope" Characters

Leaf cells long (>5:1). Cells smooth .	Group A21
Leaf cells intermediate in length (2-5:1). Cells distinctly papillose .	Group A22
Cells distinctly prorulose .	Group A23
Cells smooth or indistinctly ornamented.#	Group A24
Leaf cells short (<2:1). Cells distinctly papillose .	Group A25
Cells smooth or indistinctly ornamented.#	Group A26

Note - Cells bulging, mammillose (both bulging and papillose) or indistinctly papillose, i.e., low papillae. An expanded explanation of the difference between "Distinct" and "Indistinct" surface ornamentation is found in the Introduction.

Cell length to breadth **ratio**:

Long cells: >5:1; commonly termed linear.

Intermediate cells: 2-5:1; commonly termed elongated, rectangular, hexagonal, or rhomboidal.

Short cells: <2:1; commonly termed isodiametric, quadrate, rounded-quadrate, or sub-quadrate.