Overview – Hornworts & Liverworts

Revised through 23 July 2012

Plants a flat plate or sheet of tissue, i.e., "thalloid"; typically strap-shaped or rosette-like. Plants deep blue-green from symbiotic cyanobacteria; 1(2) chloroplasts per cell (except Megaceros); sporophytes long cylindrical with stomata & a columella – the "Hornworts"

Plants opaque with internal air chambers or air-channels; rhizoids often "pegged"; setae very short or lacking – the "Complex thalloid" liverworts.

Plants translucent and thalloid (some with irregular leaf-like lobes); lacking air chambers, air-channels or pegged rhizoids; setae very long – the "Simple thalloid" liverworts.

Plants with a distinctive stem, and leaves of a regular shape – the "Leafy" liverworts.

The "Complex" Thalloid Liverworts

Thalli a rosette (or hemi-rosette) with dichotomous lobes; sporophytes embedded in thallus. Group C1

Thalli rolled into blackish-purple, worm-like tubes when dry. Group C2

Thalli with gemmae receptacles. Group C3

Thalli with scales distinctively protruding from below. Group C4

Thalli with air pores on the dorsal surface (distinct to indistinct). Group C5

Thalli lacking any of the above unique characteristics. Group C6

The "Simple" Thalloid Liverworts

Thalli an aquatic vertical axis with a stair-step like (helicoidal) wing; CA, NM, SD, TX. Riella

Thalli with distinct dorsal "flaps"; TX Petalophyllum

Thalli a lobed rosette ±totally covered with vase or urn-shaped involucres; WS Sphaerocarpos

Thalli with a distinct midrib & unistratose wings. Group S1

Thalli with a indistinct midrib & multistratose wings thinning to the margin. Group S2

Thalli with distinctly wavy or irregular margins. Group S3

Thalli narrow with irregular, leaf-like lobes. Group S4
The "Leafy" Liverworts

Leaves with ciliate lobes (±one cell in diameter) to near base or with distinctly ciliate margins.  Group L1

Leaves 3-4 lobed or toothed.  Group L2

Leaves complicate-bilobed (leaves folded into differentiated dorsal & ventral halves). Dorsal half larger (appearing incubous).

Underleaves readily evident.  Group L3

Underleaves vestigial or lacking.  Group L4

Ventral half larger (appearing succubous); underleaves lacking.  Group L5

Leaves distinctly bilobed, but not folded, i.e., plane with two similar lobes. Leaves with distinctly succubous insertion.

Underleaves readily evident.  Group L6

Underleaves vestigial or lacking.  Group L7

Leaves with sub-transverse to transverse insertion.*  Group L8

*Lower leaves may show trend towards succubous insertion, except for Herbertus which may show trend towards incubous insertion.

Leaves unlobed to emarginate. Leaves with distinctly incubous insertion.  Group L9

Leaves with distinctly succubous insertion. Underleaves readily evident.  Group L10

Underleaves obscured by rhizoids, minute or lacking.  Group L11

Leaves with sub-transverse to transverse insertion.  Group L12

End.