

Sub-Guide to Hornworts & "Complex" Thalloid Liverworts

Revised through 17 May 2010

Group H – Hornworts

	Group H
Thalli large (2-6 cm) & ±dichotomous with fimbriate /erose margins; on rocks in streams ; SC, TN	<i>Megaceros</i>
Thalli smaller & rosette -like; usually not on rocks in streams.	
Sporophytes short, fusiform, horizontal , & scarcely exserted, thalli small (~1 cm); E	<i>Notothylas</i>
Sporophytes linear, erect, exserted ; thalli larger (>1 cm).	
Spores black ; thalli with ±crenate-crispate margins, dorsal lamellae & cavities ; WS	<i>Anthoceros</i>
Spores yellow ; thalli with ±entire margins; lacking lamellae & interior cavities; WS	<i>Phaeoceros</i>

Group C1 – Thalli rosette-like with embedded sporophytes

	Group C1
Epidermal pores conspicuous & stellate ; ventral scales long, projecting & hyaline ; sporophytes in a dorsal, sessile, pyriform involucre ; TX, OK, KS	<i>Oxymitra</i>
Epidermal pores obscure & simple ; sporophytes deeply sunken in the thallus.	
Plants typically floating with purplish , sword-like, serrulate ventral scales (lacking when stranded); thallus midline distinct to base of thallus; oil cells in epidermis; WS	<i>Ricciocarpos</i>
Plants terrestrial ; thallus midline ±restricted to apices of thalli; oil cells lacking ; WS	<i>Riccia</i> †

Group C2 – Thalli rolled into a purple tube when dry

	Group C2
Epidermis with strongly elevated pores & bulging trigones; ventral scales with a single, lanceolate appendage; air chambers in one layer with filaments; involucre apical & clam-like ; W	<i>Targionia</i>
Epidermis commonly smooth & lacking bulging trigones; ventral scales various ; air chambers of thalli in multiple layers; carpocephala elevated .	
Archegonia & carpocephala arising from an dorsal crypt behind the apex; stalk of carpocephala short & lacking a rhizoidal furrow; involucre ±spherical & opening via a vertical slit ; SW, TX, OZ, NC	<i>Plagiochasma</i>
Archegonia & carpocephala arising from an apical notch; stalk of carpocephala long & with a rhizoidal furrow .	
Epidermal pores surrounded by 4-5 concentric rings of cells; thallus margins crenulate ; carpocephala distinctly lobed ; WS	<i>Reboulia</i>
Epidermal pores surrounded by 1-2 concentric rings of cells.	
Sporophytes enclosed in lanceolate, hyaline scales (pseudoperianth remnants); antheridia adjacent to archegonia in most species; WS	<i>Asterella</i> †
Sporophytes not enclosed in scales; antheridia distant from archegonia in most species (often on separate thallus branches); WS	<i>Mannia</i> †

Group C3 – Thalli with gemmae receptacles

Group C3

Gemmae receptacles cup-shaped ; pores of dorsal epidermis compound (barrel-shaped); WS	<i>Marchantia</i>
Gemmae receptacles crenate-shaped ; pores of dorsal epidermis simple ; greenhouse weed; WS*	<i>Lunularia</i>

Group C4 – Thalli with protruding scales

Group C4

Thalli usually in rosettes or hemi-rosettes & with an impressed, dorsal midline (at least apically); sporophytes sessile or embedded . Epidermal pores conspicuous & stellate ; sporophytes in a dorsal, sessile, pyriform involucre ; TX, OK, KS	<i>Oxymitra</i>
Epidermal pores obscure & simple ; sporophytes deeply sunken in the thallus; WS	<i>Riccia</i> †
Thalli not in rosettes & lacking a dorsal midline; sporophytes in an elevated carpocephalum. Archegonia & carpocephala arising from an apical notch; epidermal pores simple ; oil cells present. Sporophytes enclosed in lanceolate, hyaline scales (pseudoperianth remnants); antheridia adjacent to archegonia in most species; WS	<i>Asterella</i> †
Sporophytes not enclosed in scales; antheridia distant from archegonia in most species (often on separate thallus branches); WS	<i>Mannia</i> †
Archegonia & carpocephala arising from an dorsal crypt behind the apex; epidermal pores ±strongly stellate ; oil cells lacking ; A/A, AZ, TX	<i>Athalamia</i>

Group C5 – Thalli with dorsal air pores

Group C5

<p>Polygonal surface areolation strikingly obvious to the naked eye; pores simple & on elevated, white cones composed of 4-5 rings of cells; 2 rows of ventral scales with a kidney-shaped appendage; carpocephala cone-shaped; WS</p>	<i>Conocephalum</i>
<p>Polygonal surface areolation evident with a hand-lens. Ventral scales in 4 rows & appendiculate; pores barrel-shaped & composed of 4-7 rings of cells; antheridial disk stalked; carpocephala deeply lobed; circular gemmae cups common; WS</p>	<i>Marchantia</i>
<p>Ventral scales in 2 rows. Ventral scales purple & appendiculate. Pores barrel-shaped, composed of 4-5 rings of cells & cruciate. Air chambers of thallus multilayered & lacking filaments; NW Air chambers of thallus in one layer with filaments; WS</p>	<i>Bucegia</i> <i>Preissia</i>
<p>Pores stellate & surrounded by 1 ring of cells; carpocephala lobed; A/A</p>	<i>Peltolepis</i>
<p>Ventral scales hyaline. Ventral scales appendiculate; pores simple & surrounded by 4-6 rings of cells. Thallus wing thin, undulate & plane (dry); carpocephala ±flat; WC Thallus wing thick, plane & ±incurved (dry); crescent shaped gemmae cups common; escapes from greenhouses; WS*</p>	<i>Cryptomitrium</i> <i>Lunularia</i>
<p>Ventral scales lacking appendages; pores stellate & surrounded by 1 ring of cells; carpocephala deeply lobed; A/A</p>	<i>Sauteria</i>
<p>Ventral scales scattered, small & with a filamentous, ephemeral appendage; pores simple & surrounded by 1-2 rings of slightly modified cells; sporophytes sessile on thallus; TX, LA</p>	<i>Corsinia</i>
<p>Polygonal surface areolation indistinct; ventral scales in 2 rows, appendiculate & ±purple. Archegonia & carpocephala arising from an dorsal crypt behind the apex; stalk of carpocephala short & lacking a rhizoidal furrow; involucre ±spherical & opening via a vertical slit; SW, TX, OZ, NC</p>	<i>Plagiochasma</i>
<p>Archegonia & carpocephala arising from an apical notch; stalk of carpocephala long & with a rhizoidal furrow. Pores simple & surrounded by 4-5 rings of cells with ±thickened radial walls; thallus margins crenulate; carpocephala divided into discrete lobes; WS.</p>	<i>Reboulia</i>
<p>Pores simple & surrounded by 1-2 rings of cells with thin radial walls; carpocephala ±unlobed. Capsules surrounded by a pendant, white skirt of lanceolate segments; WS Capsules lacking a white skirt; WS</p>	<i>Asterella</i> <i>Mannia</i>

Group C6 – Thalli lacking the above characteristics

Group C6

Plants primarily **floating** (may be stranded); thalli **linear** & freely **dichotomous**; epidermal pores, air chambers & ventral scales usually **present**; WS

Riccia†

Plants **terrestrial**; thalli **leathery** & broadly **strap-shaped** with stiff marginal **hairs**; epidermal pores, air chambers & ventral scales vestigial to **lacking**; E

Dumortiera
