

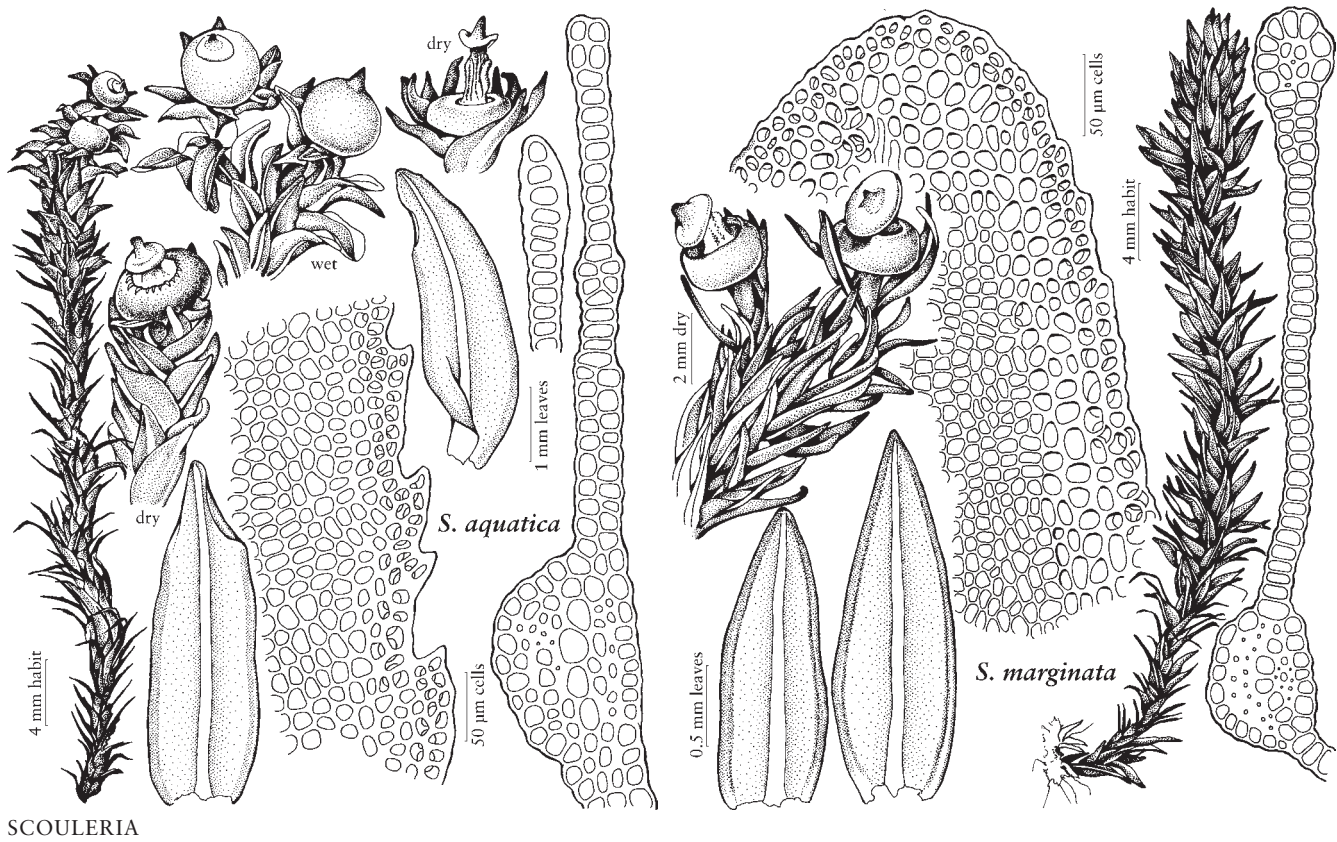
17. SCOULERIACEAE S. P. Churchill

Steven P. Churchill

Plants medium to large, usually dark green or black with distal portions green. **Stems** elongate, rarely short, freely branching, transverse section with epidermis, 2–3 outer cortical layers of small, thick-walled cells, inner cortex of large, hyaline, thin-walled cells, central strand absent [present]; rhizoids dense, at base of stems, dark red, smooth, or appearing weakly papillose. **Leaves** of stem and branch similar, crowded, ligulate to oblong-lanceolate, spreading to recurved when wet; margins entire, weakly to strongly dentate or bluntly serrate in distal half, rarely extending toward base, border present or absent; base slightly clasping, weakly decurrent; apex obtuse to rounded [acute]; costa single, stout, percurrent, abaxial and adaxial surface cells differentiated, thick-walled, stereid cells in 2 bands of 1–3 rows, or absent adaxially, guide cells few, in 1 or rarely 2 rows; basal cells short to long-rectangular, submarginal cells often differentiated as a border, long-rectangular, mostly thin-walled, smooth; medial and distal laminal cells isodiametric, quadrate to subquadrate, smooth, thick-walled. **Specialized asexual structures** absent. **Sexual condition** dioicous; perigonia lateral on stem and branches, sessile, perigonial leaves broadly ovate, concave, margins entire, apex obtuse-rounded, costa weak; perichaetia terminal to subterminal, ovate and bluntly acute or rounded, interior leaves ligulate to ovate-lanceolate. **Seta** single, very short and stout, erect. **Capsule** erect, immersed to emergent, light to dark brown or rusty red, spherical to obovoid, urn becoming compressed basally and columella with attached operculum appearing exerted when dry, columella persistent; exothecial cells transversely elongate, thick-walled; stomates absent; annulus absent; operculum low-conic, mammillate or apiculate, attached to columella; peristome absent or present, single, when present teeth 32, set below capsule mouth, recurved back on capsule mouth when dry, exterior surface with projecting lamellae, interior surface slightly projecting or not. **Calyptra** cucullate, entire, smooth, and naked. **Spores** granulate to gemmate-papillose.

Genera 2, species 3 (1 genus, 2 species in the flora): North America, s South America, n Asia, Antarctica (subantarctic islands).

SELECTED REFERENCES Britton, E. G. 1895. Contributions to American bryology. IX. A revision of the genus *Scouleria* with description of one new species. Bull. Torrey Bot. Club 22: 36–43. Churchill, S. P. 1985b. The systematics and biogeography of *Scouleria* Hook. (Musci: Scouleriaceae). Lindbergia 11: 59–71.



SCOULERIA

1. SCOULERIA Hooker, Bot. Misc. 1: 33. 1829 • [For John Scouler, 1804–1871, physician, botanical collector, and naturalist]

Grimmia sect. *Scouleria* (Hooker) Müller Hal.; *Grimmia* subgen. *Scouleria* (Hooker) Lesquereux & James

Plants clustered in loose to compact tufts, black or brown with age. **Stems** ca. 4–10 cm, central strand absent; rhizoids forming a “hold-fast,” occasionally extending from stem and abaxial surface of leaves. **Leaves** erect to patent when dry, when present pseudocosta marginal [submarginal]; apex often cucullate. **Outer perichaetial leaves** one-third shorter than inner leaves. **Vaginula** forming a sheath around proximal third or fourth of seta. **Seta** $\frac{1}{3}$ – $\frac{1}{2}$ capsule length. **Capsule** glossy black with age, columella when dry appearing longitudinally ribbed, when wet expanding, becoming stoutly cylindrical or ovoid. **Spores** 30–55 µm.

Species 3 (2 in the flora): nw North America, temperate South America, n Asia.

Scouleria patagonica is the only taxon found in South America.

- 1. Leaf margin 1-stratose or partially (rarely fully) 2-stratose; peristome present 1. *Scouleria aquatica*
- 1. Leaf margin multistratose; peristome absent 2. *Scouleria marginata*

1. *Scouleria aquatica* Hooker in T. Drummond, *Musc. Amer.*, 63. 1828 [E]



Scouleria muelleri Kindberg

Stem leaves ligulate to lanceolate, (2.8–)3–5 × 0.8–2.5 mm, margins 1-stratose or partially (rarely fully) 2-stratose, serrate distally; basal laminal cells isodiametric to shortly rectangular or juxtacostal cells linear to long-rectangular, 15–36 × 10–12 μm; medial and

distal laminal cells 10–25 μm; marginal laminal cells similar to the medial or appearing differentiated, darker and walls thicker, 1-stratose to partially to nearly entirely 2-stratose. **Peristome** present.

Aquatic habitats, banks or bed of streams and rivers, on rock; low to high elevations (0–1900 m); Alta., B.C., N.W.T., Yukon; Alaska, Calif., Idaho, Mont., Oreg., Wash., Wyo.; Asia (Russia: Amur Region, Siberia).

The present concept of *Scouleria aquatica* is broad, encompassing several forms. Virtually all the variation is found in the gametophyte. Leaves vary in size and in particular marginal differentiation: 1-stratose with cells similar or slightly thicker and darker in color, to partially or nearly fully 2-stratose to near the leaf apex. Smaller plants are found in the northern range of the species (and also in Russia). Further studies, particularly molecular, could very well differentiate some of these populations as distinct taxa (at the subspecific or specific level).

2. *Scouleria marginata* E. Britton, *Bull. Torrey Bot. Club* 22: 42. 227. 1895 [E] [F]



Stem leaves 3–3.5(–4) × 1–1.3 mm, margins multistratose throughout except 2-stratose at apex (pseudocosta in cross section with chlorophyllose outer epidermal cells and small, thick-walled inner cells), toothed or entire; basal; laminal cells rectangular to quadrate, 15–40

× 7–10 μm, juxtacostal cells shorter; medial and distal laminal cells 10–15(–18) μm; marginal laminal cells with stereid cells 150–200 μm. **Peristome** absent.

Exposed to submerged in streams or rivers, rocks, particularly granitic; moderate to high elevations (1000–1800 m); B.C.; Calif., Idaho, Mont., Oreg, Wash.