

7. BUXBAUMIACEAE Schwägrichen

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Plants microscopic, annual or perennial from persistent protonema. **Archegoniate plants** composed of a perichaetium of a few, mainly non-chlorophyllose ecostate leaves that enclose very few archegonia. **Antheridial plants** reduced to a 1-stratose, 2-lipped structure enclosing a single spherical antheridium, arising from a short branch of the protonema. **Seta** elongate. **Capsule** usually obliquely oriented, upper face flat or bulging and often distinguished from lower face by a perimeter ridge, broadly ovate to lance-cylindric; operculum conic, nearly perpendicular to upper face of capsule; peristome with endostome 16-pleated, a hyaline cone, exostome of one or more rows of articulated teeth, irregular in number, sometimes rudimentary. **Calyptra** smooth, conic, barely covering operculum, early deciduous.

Genus 1, species 12 (4 in the flora): widely distributed in temperate to subtropical regions of the Northern Hemisphere, scattered in the tropics, Pacific Islands (New Zealand), Australia.

1. BUXBAUMIA Hedwig, Sp. Musc. Frond., 166. 1801 • [For J. C. Buxbaum, 1693–1730, its discoverer]

Archegoniate plants of 1-stratose, ovate to ovate-lanceolate leaves, leaves with ciliate or jagged margins. **Seta** erect, rough, red-brown when mature, 3–15 mm, bulging where it joins the oblique capsule.

Species 12 (4 in the flora): North America, Europe, Asia, Pacific Islands (New Zealand), Australia.

Buxbaumia plants are unlikely to be seen unless sporophytes are present. No other genus in North America is likely to be confused with it, as the characteristic obliquely oriented sporangium on erect rough seta makes it distinctive. Sporophytes appear in fall, capsules mature in spring.

1. Upper face of capsule, when mature, with a shiny ridge bounding the margin of the face.
 2. Capsule glossy, dark chestnut red-brown when mature, broadly ovoid, face nearly perpendicular to seta 1. *Buxbaumia aphylla*
 2. Capsule dull brown to greenish brown when mature, narrowly ovoid, face strongly oblique to seta 3. *Buxbaumia piperi*
1. Upper face of capsule, when mature, not or weakly bounded by a marginal ridge, but gradually merging with lower face.
 3. Capsule narrowly ovoid to cylindrical; exterior membrane of upper face intact when mature, not opalescent, generally dull 2. *Buxbaumia minakatae*
 3. Capsule ovoid; exterior membrane of upper face of capsule splitting irregularly longitudinally and curling outward or inward, opalescent 4. *Buxbaumia viridis*

1. *Buxbaumia aphylla* Hedwig, Sp. Musc. Frond., 166. 1801



Seta 4–11 mm, straight. **Capsule**, when mature, broadly ovoid, 3–7 mm and nearly as wide, rich, glossy, chestnut brown, upper face flattened and sharply differentiated from lower face by a dark brown ridge, oblique or nearly at right angles to seta. **Spores** 6–8 μm .

Capsules mature late spring–fall. Decaying wood, humus, sometimes shallow acid soil and soil depressions on rock outcrops, mainly in well-illuminated to somewhat shaded sites, low to moderate elevations; Alta., B.C., N.B., Nfld. and Labr. (Nfld.), N.S., Ont., P.E.I., Que.; Alaska, Calif., Colo., Conn., Del., Ill., Iowa, Maine, Mass., Mich., Mont., N.H., N.J., N.Y., N.C., Ore., Vt., Va., Wash.; Europe; Asia; Pacific Islands (New Zealand).

SELECTED REFERENCE Hancock, J. A. and G. R. Brassard. 1974. Phenology, sporophyte production and life history of *Buxbaumia aphylla* in Newfoundland, Canada. *Bryologist* 77: 501–513.

2. *Buxbaumia minakatae* S. Okamura, Bot. Mag. (Tokyo) 25: 30, fig. 1. 1911 [F]



Buxbaumia subcylindrica Grout

Seta 3–5 mm, straight to somewhat arcuate. **Capsule** when mature narrowly ovoid to nearly cylindrical, 3–5 mm, dull brown to rusty-brown, upper face not strongly differentiated from lower face, slightly oblique to seta or nearly erect. **Spores** 12–13 μm .

Capsules mature late summer–fall. Soft decaying decorticated logs in deciduous to mixed forest; low elevations (20–150 m); Nfld. and Labr. (Nfld.), N.S., Ont.; Mass., Mich., N.Y., N.C., Vt., Va.; e Asia (Russian Far East).

Buxbaumia piperi has occasionally been confused with this species, but the sporangium shape (narrowly ovate to cylindrical) and the shorter, often arcuate seta separate *B. minakatae*; *B. piperi* has a longer, straight seta and ovate sporangium. A report of *B. indusiata* (A. J. Grout 1928–1940, vol. 1) was based on misidentifications of eastern North American material.

3. *Buxbaumia piperi* Best, Bull. Torrey Bot. Club 20: 116. 1893 [E][F]



Seta 3–6 mm, straight to somewhat arcuate. **Capsule** when mature ovoid to narrowly ovoid, 3–5 mm, upper face with perimeter ridge differentiating it from lower face, dull brown to greenish brown, not glossy. **Spores** 7–12 μm .

Capsules mature late summer–fall. Commonly on rotten decorticated logs, but also on humus banks, mainly subalpine but also occasionally to near sea level, mainly in coniferous forests; low to moderate elevations (10–1500 m); Alta., B.C., Alaska, Calif., Colo., Idaho, Mont., Ore., Wash.

This endemic species may resemble *Buxbaumia aphylla*. The sporangium however, is never glossy chestnut when mature, but is dull and greenish brown; the exostome is in 2–3 rows rather than one row as in *B. aphylla*.

SELECTED REFERENCE Ligrone, R. R. et al. 1982. Gametophyte and sporophyte ultrastructure in *Buxbaumia piperi* (Buxbaumiaceae, Musci). *J. Hattori Bot. Lab.* 52: 465–499.

4. *Buxbaumia viridis* (de Candolle) de Candolle in J. B. Mougeot et al., *Stirp. Crypt. Vogeso-Rhen.* 8: no. 724. 1823



Buxbaumia aphylla var. *viridis* de Candolle in J. Lamarck and A. P. de Candolle, *Fl. Franç.* ed. 3, 6: 227. 1815; *B. indusiata* Bridel

Seta 5–10 mm, straight. **Capsule**, when mature, ovoid, 3–5 mm, stamineous to opalescent and glossy, oblique face gradually differentiated from lower face, with exterior membrane splitting longitudinally and incurved or curved outward when drying. **Spores** 8–12 μm .

Capsules mature late summer–fall. Decorticated wood or humus banks in coniferous forests; high (subalpine) elevations; Alta., B.C.; Calif., Idaho, Mont., Oreg., Wash.; Europe.