

## LEPTOGIUM

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*Leptogium* (Ach.) Gray, *Nat. Arr. Br. Pl.* 1: 400 (1821); named from the Greek *leptos* (thin, fine), probably in reference to the thin thallus of some species.

Type: *L. laceum* (Sw.) S.F.Gray, *fide* P.M.Jørgensen pers. comm.

Thallus (in Australia) foliose to subsquamulose, adnate to  $\pm$ pulvinate, lobate,  $\pm$ isidiate or  $\pm$ lobulate, lacking soredia. Lobes flat to plicate, spreading to erect. Cortex present; cells  $\pm$ isodiametric, usually in single layer; surfaces  $\pm$ smooth, wrinkled or ridged, glabrous or the lower usually with simple rhizines, irregular holdfasts or indumentum. Medullary hyphae interwoven, sometimes paraplectenchymatous (not in Australia). Cyanobiont *Nostoc*, cells discrete or in chains. Ascوماتa apothecial, lecanorine, laminal to marginal, pedicellate, sessile, adnate or  $\pm$ immersed. Ascospores  $\pm$ 8 per ascus, ovoid, ellipsoidal or fusiform, septate to muriform, acute, acuminate or obtuse. Conidiomata pycnidial, immersed; apices emergent, papilliform. Conidia bacilliform; apices  $\pm$ swollen.

The genus *Leptogium* is best developed in tropical regions of the world but is widely distributed in warm and cool temperate regions and has a few species which reach arctic and subantarctic regions. About 160 species of which 32 are presently known from Australia, but these figures may be subject to change on completion of a current revision.

A.Zahlbruckner, *Catologus Lichenum Universalis* 3: 109–182 (1925), divided the genus into 7 sections but their taxonomic status is uncertain and they are not used here.

Significant wrinkles that can be seen at x10 magnification occur in some species. These are structural and permanent, but other wrinkles may occur in species that are usually smooth. These latter wrinkles may be induced by extreme environmental conditions such as drying.

P.M.Jørgensen, On some *Leptogium* species with short malloium hairs, *Svensk. Bot. Tidskr.* 67: 53–58 (1973a); P.M.Jørgensen, *Leptogium* Arten vom Malloium, *Typ. Herzogia* 2: 453–468 (1973b); P.M.Jørgensen, Contributions to a monograph of the malloium-hairy *Leptogium* species, *Herzogia* 3: 433–460 (1975); D.D.Awasthi & P.Akhtar, The lichen genus *Leptogium* (Sects. *Leptogium*, *Leptogiopsis* and *Homodium*) in India, *Geophytology* 8(2): 189–204 (1979); P.M.Jørgensen & P.W.James, Studies on some *Leptogium* species of Western Europe, *Lichenologist* 15(2): 109–125 (1983); G.O.A.Malme, Die Collematazeen Regnells. *Herbars. Arkiv. Bot.* 19(8): 1–29 (1925); H.A.Sierk, *Leptogium* in North America, north of Mexico, *Bryologist* 67: 245–317 (1964); E.A.Vainio, Lichenes Insularum Philippinarum iii, Helsingfors, *Ann. Akad. Sci. Fenn. ser. A* 15(6): 1–368 (1920).

- 1 Thallus isidiate
- 2 Thallus usually distinctly wrinkled (at x10 magnification)
- 3 Isidia cylindrical, simple, branched or coralloid
- 4 Isidia often coralloid; apothecia at least partially immersed in bullae or pedicellate with pedicel attached at thalline exciple and  $\pm$ covering it
- 5 Isidia to 70  $\mu$ m thick; wrinkles often thinly lamelloid; ascospores to 45  $\mu$ m long **L. coralloideum**
- 5: Isidia to 150  $\mu$ m thick; wrinkles rarely lamelloid; ascospores to 30  $\mu$ m long **L. faciifictum**

- 4: Isidia never coralloid; apothecia sessile **L. austroamericanum**
- 3: Isidia squamuliform or granular
- 6 Isidia granular; thallus with uniform whitish to dark blue indumentum below **L. asiaticum**
- 6: Isidia squamuliform; thallus without uniform indumentum below (rhizines may be present where attached to substratum)
- 7 Apothecia to 3 mm wide; thallus to 500  $\mu\text{m}$  thick; vertical walls of cortical cells sinuous (observed through surface x400); cool temperate species **L. victorianum**
- 7: Apothecia less than 3 mm wide; thallus to 220  $\mu\text{m}$  thick; vertical walls of cortical cells not sinuous; subtropical to tropical species
- 8 Apothecia to 2 mm wide, pedicellate; pedicels dilated, attached at thalline exciple and  $\pm$ covering it; thallus to 100  $\mu\text{m}$  thick **L. granulans**
- 8: Apothecia sessile to adnate; thallus more than 100  $\mu\text{m}$  thick
- 9 Apothecia to 1 mm wide, sessile to adnate, marginal, often aborted; isidia on apothecia only; thallus to 220  $\mu\text{m}$  thick **L. marginellum**
- 9: Apothecia to 2 mm wide, sessile, laminal, not often aborted; isidia mainly thalline; thallus to 150  $\mu\text{m}$  thick **L. propaguliferum**
- 2: Thallus lacking significant wrinkles (stress wrinkles may occur under extreme conditions)
- 10 Isidia cylindrical, (rarely a few flattened isidia present) **L. cyanescens**
- 10: Isidia squamuliform
- 11 Thallus to 50  $\mu\text{m}$  thick, closely adnate; rhizines minute or absent; apothecia to 1 mm wide; (subtropical to tropical species) **L. poliophaeum**
- 11: Thallus 60–130  $\mu\text{m}$  thick, loosely adnate; apothecia more than 1 mm wide or not known
- 12 Isidia often branched; rhizines usually absent, if present inconspicuous **L. crispatellum**
- 12: Isidia not branched; rhizines usually conspicuous
- 13 Usually fertile; isidia laminal and marginal; margins neither thickened nor whitish; apothecia to 4 mm wide; often with basal hairs **L. tasmanicum**
- 13: Rarely fertile; isidia marginal only; margins often thickened and whitish; apothecia to 1.5 mm wide; never with basal hairs **L. limbatum**
- 1: Thallus not isidiate; sometimes lobulate
- 14 Thallus usually distinctly wrinkled
- 15 Apothecia immersed to margin, or partially immersed, or pedicellate with dilated pedicels
- 16 Apothecia immersed to margin in raised thickened tissue which sometimes forms short solid pedicel; lobe margins often obscure **L. enkarodes**

- 16:** Apothecia partially, and obliquely immersed in small bullae, or pedicellate with dilated pedicels; lobe margins rarely obscure
- 17:** Apothecia not pedicellate; partially and obliquely immersed in small bullae, finally  $\pm$ immersed at base only; thalline exciple with concentric ridges or nodules **L. bullatulum**
- 17:** Apothecia pedicellate; pedicel dilated, attached at thalline exciple and  $\pm$ covering it; margin without concentric ridges or nodules
- 18:** Thallus to 120  $\mu$ m thick; wrinkles fine and closely anastomosing; pedicel vertically plicate **L. javanicum**
- 18:** Thallus to 300  $\mu$ m thick; wrinkles coarse and loosely anastomosing; pedicel not vertically plicate **L. phyllocarpum**
- 15:** Apothecia sessile to adnate or, if pedicellate, then pedicel narrow, not dilated attached at apothecial base (*L. wilsonii* is placed here for convenience)
- 19:** Thallus wrinkles fine, very closely anastomosing
- 20:** Thallus to 50  $\mu$ m thick; mature lobes with  $\pm$ branched lobules; ascospores c. 20  $\mu$ m long; conidia 3–4  $\mu$ m long **L. wilsonii**
- 20:** Thallus to 160  $\mu$ m thick; lobes usually without lobules; ascospores to 43  $\mu$ m long; conidia 2–3  $\mu$ m long **L. bullatulum**
- 19:** Thallus wrinkles coarse, loosely anastomosing
- 21:** Apothecia to 1.3 mm wide
- 22:** Lobes convolute; apical margins reflexed; apices flared-corniculate **L. corniculatum**
- 22:** Lobes not convolute; apices not corniculate **L. lichenoides**
- 21:** Apothecia more than 1.3 mm wide
- 23:** Thallus subpulvinate to pulvinate; mature apothecia 2.5–6 mm wide, enveloped and  $\pm$ hidden by dense large lobules **L. fallax**
- 23:** Thallus loosely to closely adnate, not pulvinate; mature apothecia less than 3 mm diam. sometimes with lobulate thalline exciple but never enveloped by dense large lobules
- 24:** Lobes anastomosing; wrinkles often thinly lamelloid; apothecia submarginal, to 2.5 mm wide **L. chloromelum**
- 24:** Lobes not anastomosing; wrinkles not thinly lamelloid; apothecia not submarginal
- 25:** Thallus to 250  $\mu$ m thick; apothecia sessile, to 2 mm wide **L. corticola**
- 25:** Thallus to 500  $\mu$ m thick; apothecia adnate to broadly adnate, rarely sessile, to 3 mm wide **L. victorianum**
- 14:** Thallus not wrinkled (stress wrinkles may occur under extreme conditions)

- 26 True cortex absent; pseudocortex often present; cells (surface view at x400 magnification) globose, rarely slightly angular, discrete, contiguous or imbricate, discontinuous, size extremely variable (bluish form commonly confused with *Leptogium azureum*) **Collema subconveniens**
- 26: True cortex present; cells (surface view at x400 magnification) usually strongly angular, connate, continuous around thallus, size variable but not extremely so
- 27 Apothecia pedicellate; pedicel dilated, as wide as or wider than apothecia **L. pellobatum**
- 27: Apothecia sessile to adnate or, if pedicellate, pedicel c. half width of apothecia
- 28 Ascospores bilocular or very rarely trilocular, to 17  $\mu\text{m}$  long **L. biloculare**
- 28: Ascospores submuriform to muriform, more than 17  $\mu\text{m}$  long
- 29 Lower surface uniformly tomentose with marginal naked area **L. menziesii**
- 29: Lower surface naked or with scattered rhizines where attached to substratum
- 30 Ascospore apices obtuse or broadly obtuse
- 31 Thallus usually subsquamulose, 0.8–2.5 cm wide
- 32 Thallus margin with sparse rotund lobules; apothecia 0.5–1.3 mm wide; disc finally flat **L. rogersii**
- 32: Thallus margin usually with oblong to subcylindrical lobules; apothecia 1–2 mm wide; disc finally strongly convex **L. pecten**
- 31: Thallus foliose, 2–6 cm wide
- 33 Rhizines usually conspicuous at x10 magnification; apothecia 2–4 mm wide; conidia 4–5  $\mu\text{m}$  long **L. tasmanicum**
- 33: Rhizines minute or absent; apothecia 1–2 mm wide; conidia 2–3  $\mu\text{m}$  long **L. philorheuma**
- 30: Ascospore apices acute or acuminate
- 34 Apothecia obliquely immersed, finally immersed at base only, occasionally adnate; thalline exciple concentrically ridged or nodulose **L. bullatulum**
- 34: Apothecia sessile to shortly pedicellate; thalline exciple smooth or wrinkled
- 35 Thallus 90–150  $\mu\text{m}$  thick; apothecia sessile; thalline exciple wrinkled; apothecial disc finally flat **L. cochleatum**
- 35: Thallus 30–100  $\mu\text{m}$  thick; thalline exciple smooth; apothecial disc finally strongly convex
- 36 Thallus 30–60  $\mu\text{m}$  thick; conidia 4–5  $\mu\text{m}$  long **L. moluccanum**
- 36: Thallus 50–100  $\mu\text{m}$  thick; conidia 2–3  $\mu\text{m}$  long **L. azureum**

