



FLAVOPARMELIA ¹

Gintaras Kantvilas ²

Flavoparmelia Hale, *Mycotaxon* 25: 604 (1986).

Type: *F. caperata* (L.) Hale

Thallus foliose, with lobes flattened, dorsiventral, eciliate; upper surface yellow to yellow-green, occasionally maculate, lacking cortical hairs and pseudocyphellae, corticate, with a pored epicortex; lower surface black, rhizinate apart from a naked, paler marginal zone to c. 2 mm wide; rhizines mostly simple or in tufts; medulla white or with yellowish pigments. Photobiont trebouxoid. Ascomata apothecia, lecanorine, laminal; disc plane to concave, imperforate, pale to dark red-brown, epruinose; proper exciple cupulate. Asci 8-spored, of the *Lecanora*-type: clavate, with a well-developed, amyloid tholus, pierced entirely by a narrow, non-amyloid *masse axiale* with parallel flanks; ocular chamber not developed. Paraphyses 2–3 µm thick, straight, sparsely branched; apices swollen to 3–5 µm. Ascospores simple, hyaline, ellipsoid, with a distinct wall to c. 1 µm thick. Conidiomata pycnidia, laminal, immersed, black and speck-like; conidia bacilliform to narrowly fusiform. Chemistry: usnic acid in the cortex, with medullary depsidones (especially protocetraric acid), depsides, fatty acids and/or yellowish medullary pigments.

A genus of about 34 species of conspicuous, yellowish, foliose lichens, with a centre of diversity in Australia, especially in more arid regions. Chemical composition is critical in distinguishing some species which are virtually identical morphologically. Molecular data indicate that its closest relatives are *Austroparmelina* (with a pale grey upper surface) and *Parmotrema*, which has broad, often ciliate lobes with a prominent, naked, marginal zone (Crespo *et al.* 2010). However, it is superficially most similar to some species of *Xanthoparmelia*, which can also be yellowish green. *Xanthoparmelia* lacks a distinct naked marginal zone on the lower surface and differs further in lacking the polysaccharide isolichenan in its hyphal walls. In practice, these two genera are unlikely to be confused, especially as *Xanthoparmelia* is almost exclusively saxicolous or terricolous, whereas most species of *Flavoparmelia* are usually corticolous or lignicolous.

Key references: Elix (1994); Kantvilas *et al.* (2002); Crespo *et al.* (2010).

1	Thallus lacking soredia, dactyls or pustules, typically occurring on bark or wood	3 <i>F. rutidota</i>
	Thallus sorediate, or with dactyls and pustules that break down into soredia; occurring on rocks, bark or wood	2
2(1)	Dactyls abundant, typically becoming abraded, erumpent and coarsely sorediate; thallus rather loosely attached, very common, usually on rocks	1 <i>F. haysomii</i>
	Dactyls absent; soredia laminal or developing from roundish, capitate pustules, coalescing and the central parts of the thallus becoming entirely sorediate; thallus typically tightly adnate, mostly on wood or bark	3
3(2)	Medulla K+ yellow→red, P+ orange (containing salazinic acid); soredia farinose	4 <i>F. soredians</i>
	Medulla K- or ± dull yellow-brown, P+ red (containing protocetraric acid or physodalic acid); soredia farinose or coarsely granular	4

1 This work can be cited as: Kantvilas G (2023). *Flavoparmelia*, version 2023:1. In MF de Salas (Ed.) *Flora of Tasmania Online*. 4 pp. (Tasmanian Herbarium, Tasmanian Museum and Art Gallery: Hobart). <https://flora.tmag.tas.gov.au/lichen-genera/flavoparmelia/>

2 Tasmanian Herbarium, Tasmanian Museum & Art Gallery, PO Box 5058, UTAS LPO, Sandy Bay, TAS 7005, Australia.

- 4(3) Soredia farinose, laminal; thallus containing physodalic acid 5 *F. springtonensis*
 Soredia coarsely granular, originating from roundish, capitate pustules; thallus containing
 protocetraric acid 2 *F. haywardiana*

1 *Flavoparmelia haysomii* (C.W.Dodge) Hale

Mycotaxon 25: 605 (1986); —*Parmelia haysomii* C.W.Dodge, *Nova Hedwigia* 15: 295 (1968).

Thallus loosely adnate, forming extensive, continuous colonies; lobes (0.5–)1–5 mm wide, loosely imbricate, with the apices rounded and irregularly crenate or notched; upper surface pale yellow, smooth to weakly scrobiculate to wrinkled, often faintly reticulately maculate near the apices; dactyls laminal, very abundant, crowded together and convoluted, hollow, simple or occasionally branched, apically 0.1–0.5 mm wide, becoming erumpent, abraded and coarsely sorediate, at length with the central parts of the thallus becoming a granular-sorediate mass; medulla white, sometimes with orange-yellow patches (skyrin) in the lowermost part. Apothecia to 3(–5.5) mm wide; disc glossy, dark brown, concave to undulate; thalline margin persistent, inrolled, smooth and crenulate at first, becoming cracked, dactylate, abraded and wrinkled with age. Ascospores 12–14.6–17(–20) × 6–8.2–10 μm. Conidia 5–9 × 1 μm.

Chemistry: usnic acid, protocetraric acid and caperatic acid (major compounds), ± skyrin; medulla K–, KC–, C–, P+ red, UV–; orange parts K+ purple.

Very common on exposed, sunny rocks from coastal to alpine elevations. Large boulders in coastal heathland, alpine vegetation and buttongrass moorland, or rocky crags in open eucalypt woodland are prime habitats. More rarely this species also occurs on dead wood. It is also known from the southern Australian mainland, New Zealand and Macquarie Island. Earlier records from Tasmania of *Parmelia caperata* L. [= *Flavoparmelia caperata* (L.) Hale], a Northern Hemisphere species, refer to *F. haysomii*.

Table Mtn, 42°14'S 147°08'E, 1095 m, 1972, G.C. Bratt 72/406 & J.A. Cashin (AD, HO); Hermit Valley, 42°50'S 146°07'E, 330 m, 2001, G. Kantvilas 96/01 (HO); Cape Barren Island, northern slope of Phils Hill, 40°22'34"S 148°14'50"E, 115 m, 2007, J.S. Whinray L4694 (CANB, HO, MEL).

2 *Flavoparmelia haywardiana* Elix & J.Johnst.

Mycotaxon 33: 392 (1988).

Thallus generally adnate, to 10 cm wide, often coalescing with adjacent thalli into extensive colonies; lobes 1–5 mm wide, imbricate, with the apices rounded and irregularly crenulate, notched or abraded; upper surface pale yellow, smooth to weakly scrobiculate to intensely wrinkled, occasionally faintly reticulately maculate near the apices, sorediate; soredia laminal, more rarely also marginal, coarsely granular, concolorous with the thallus or paler, arising in rounded, ± capitate pustules, eventually coalescing into a continuous, granular mass covering the older, central parts of the thallus; medulla white, rarely with orange-yellow patches in the lowermost part. Apothecia very rare, mostly poorly developed, to 4 mm wide; disc glossy, pale to dark red-brown, concave; thalline margin persistent, inrolled, soon becoming cracked, abraded, wrinkled and sorediate. Ascospores 11–14.4–16.5(–17) × 6–8.7–9.5(–10) μm. Pycnidia very rare; conidia 5.5–8 × 1 μm.

Chemistry: usnic acid and protocetraric acid (major compounds), often with traces of several additional substances including caperatic acid, alectorialic acid, virensic acid, atranorin and skyrin; medulla K–, KC–, C–, P+ red, UV–.

Locally common in drier parts of Tasmania, especially in the Midlands and Fingal Valley, where it occurs in farming country, especially on fence posts, rails and palings, and on dead, decorticated paddock trees. It is also known from mainland Australia (South Australia) and New Zealand.

Tasman Hwy, 1 km N of Denison Rivulet, 41°48'S 148°16'E, 20 m, 2001, G. Kantvilas 616/01 (HO); near Osmaston, 41°34'S 146°44'E, 220 m, 2001, G. Kantvilas 1073/01 (HO); Poatina Rd, c. 3 km E of Poatina, 41°47'S 146°59'E, 2001, J. Jarman (HO).

3 *Flavoparmelia rutidota* (Hook.f. & Taylor) Hale

Mycotaxon 25: 605 (1986); —*Parmelia rutidota* Hook.f. & Taylor, *London J. Bot.* 3: 645 (1844); *Pseudoparmelia rutidota* (Hook.f. & Taylor) Hale, *Phytologia* 29: 191 (1974). Type: Van Diemens Land [Tasmania], R.W. Lawrence [lecto, *fide* M.E. Hale (1976)—FH].

Flavoparmelia jeleneckii (Kremp.) Hale, *Mycotaxon* 25: 605 (1986); —*Parmelia jeleneckii* Kremp., in E. Fenzi, *Reise Novara: Lichenes* 2: 114 (1870).

Parmelia ochroleuca Müll.Arg., *Flora* 65: 306 (1882).

Parmelia subcaperatula Nyl., in J.M. Crombie, *J. Linn. Soc., Bot.* 17: 394 (1879) Type: Tasmania, Derwent River, R. Brown [lecto, *fide* M.E. Hale (1976)—H-NYL!; isolecto—BM].

Thallus adnate, forming extensive, continuous colonies; lobes 2–8 mm wide, irregularly branched, crowded and imbricate in the thallus centre, broadly rounded and irregularly crenate or notched at the apices; upper surface yellow-green to green, rugulose to wrinkled, often intensely so in older parts, emaculate, typically abundantly speckled with black pycnidia, lacking dactyls or soredia; axils irregular; medulla mostly white, occasionally with scattered yellowish patches in the lower part. Apothecia to 5(–7) mm wide; disc glossy, pale to deep red-brown to dark brown, persistently concave; thalline margin persistent, inrolled, becoming radially cracked and wrinkled with age. Ascospores 12–14.4–16.5(–17) × (6–)6.5–8.2–10 µm. Conidia 5–8 × 1 µm.

Chemistry: usnic acid, protocetraric acid and caperatic acid (major compounds); medulla K–, KC–, C–, P+ red, UV–.

One of Tasmania's most common, widespread and conspicuous foliose lichens, forming extensive, spreading colonies that can clothe almost entire tree trunks, branches, fences and other substrata. It can be the dominant species in low rainfall areas but, in the wetter western parts of the island, it becomes increasingly confined to the coast. It is especially common in suburban and farming situations on exotic, deciduous trees and on fences. It is widespread in mainland Australia and has also been recorded from the southern U.S.A. There are several superficially similar species that differ chemically, but none of these occurs in Tasmania.

Ocean Beach, 42°07'S 145°16'E, 2–5 m, 1984, A. Moscal 5506 (HO); W of Doctors Rocks, 41°00'S 145°44'E, 20 m, 1972, G. Kantvilas 1120/01(HO); near Baden, 42°26'S 147°30'E, 380 m, 2001, G. Kantvilas 124/08 (HO).

4 *Flavoparmelia soledians* (Nyl.) Hale

Mycotaxon 25: 605 (1986); —*Parmelia soledians* Nyl., *Bull. Soc. Linn. Normandie*, sér. 2, 6: 259 (1872); *Pseudoparmelia soledians* (Nyl.) Hale, *Phytologia* 29: 191 (1974).

Thallus tightly adnate, to 10 cm wide, frequently coalescing into more extensive colonies; lobes 0.5–4 mm wide, imbricate, with the apices rounded and irregularly notched; upper surface pale yellow to greenish yellow, smooth, undulate or wrinkled, sometimes weakly reticulately maculate at the apices, sorediate; soredia farinose, concolorous with the thallus or paler, laminal, arising in discrete, roundish or oval soralia that soon coalesce to eventually cover the older parts of the thallus; medulla white. Apothecia and pycnidia unknown.

Chemistry: usnic acid and salazinic acid (major compounds), sometimes together with traces of galbinic, protocetraric and consalazinic acids; medulla K+ yellow→red, KC–, C–, P+ orange.

Widespread throughout the temperate latitudes of the world and locally common in Tasmania at lowland elevations, mainly across the north and in the east, but with a highly specialised habitat ecology. It is found on fence posts in paddocks, on stockyard rails and on introduced trees in farmland, but is only rarely seen in natural vegetation where it grows mostly on rocks. It can be distinguished reliably from the morphologically identical *F. springtonensis* only by chemical means.

Highfield, 40°44'53"S 145°17'31"E, 25 m, 2001, G. Kantvilas 1284/01 & J. Jarman (HO); Cape Deslacs, 42°59'S 147°33'E, 40 m, 2001, G. Kantvilas 464/01 (HO); Cape Portland, 40°45'S 147°57'E, 5 m, 2018, G. Kantvilas 270/18 (HO).

5 *Flavoparmelia springtonensis* (Elix) Hale

Mycotaxon 25: 605 (1986); —*Parmelia springtonensis* Elix, in J.A. Elix & G.N. Stevens, *Austral. J. Bot.* 27: 879 (1979).

Morphologically indisistinguishable from *F. soledians*, and likewise farinose-solediate. Apothecia and pycnidia unknown.

Chemistry: usnic acid, physodalic acid (major compounds), sometimes together with traces of atranorin and alectorialic, protocetraric, virensic and conphysodalic acids; medulla K⁻ or ± yellow-brown, KC⁻, C⁻, P⁺ red, UV⁻.

Localised in the north, especially the Northern Midlands and Nile Valley, with a habitat ecology very similar to that of *F. soledians*. It occurs on fence posts, paling fences, stockyard rails and, rarely, on dead, decorticated eucalypts in paddocks, along roadsides and in gardens.

Evandale Cemetery, 41°34'S 147°15'E, 160 m, 2001, J. Jarman (HO); Mt Joy Rd near Valleyfield, 41°08'S 147°16'E, 160 m, 2001, G. Kantvilas 571/01 & J. Jarman (HO); Isandula Road, SE of North Motton, 41°14'S 146°08'E, 140 m, 2001, G. Kantvilas 1096/01 (HO).

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