

GROUP F

[Thallus saxicolous; apothecia verruciform; asci 8-spored]

1	Ascospores predominantly uniseriate.....	2
1:	Ascospores predominantly biseriata.....	7
2	Thiophanic acid absent.....	3
2:	Thiophanic acid present.....	4
3	Thallus UV+ yellow; lichexanthone present.....	P. consanguinea
3:	Thallus UV+ dull orange; 4,5-dichlorolichexanthone present.....	P. lophocarpa
4	Stictic acid absent.....	P. petrophyes
4:	Stictic acid present.....	5
5	Thallus dull yellowish green to pale olive-green; northern N.T.....	P. dissita
5:	Thallus dull to bright yellow; eastern Australia.....	6
6	Thallus isidiate, rarely fertile.....	P. xanthodactylina
6:	Thallus lacking isidia, usually fertile.....	P. hypoxantha
7	Ascospores < 60 µm long.....	8
7:	Ascospores > 60 µm long.....	9
8	Thallus lacking lichen compounds.....	P. paratropa
8:	Thallus containing stictic acid.....	P. macra
9	Thallus UV+ yellow; lichexanthone present.....	P. hadrocarpa
9:	Thallus UV- or + dull orange; lichexanthone absent.....	10
10	Thallus KC-.....	P. lavata
10:	Thallus KC+ yellow-orange or orange.....	11
11	Ascospores hyaline; thiophanic acid present.....	P. thula
11:	Ascospores often blue-grey or brown; arthothelin present.....	P. melanospora

***Pertusaria consanguinea* Müll.Arg., *Flora* 67: 283 (1884)**

T: Apiahy, Brazil, 1880, *J.I.Puiggari s.n.*; lecto: G, *vide* A.W.Archer, *Mycotaxon* 51: 254 (1991).

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 61, fig. 13 (1997).

Thallus thin, pale fawn, dispersed, smooth and dull; margin well defined. Soredia and isidia absent. Apothecia conspicuous, scattered, verruciform, sometimes confluent, flattened-hemispherical, usually constricted at the base, 1–2 (–3) mm diam. Ostioles inconspicuous, black, punctiform, sometimes sunken, 1 or 2 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal to subfusiform, smooth, 75–105 × 35–50 µm.

Chemistry: Thallus K–, KC–, C–, Pd–, UV+ yellow; containing lichexanthone (major) and 2-*O*-methyl-perlatolic acid (major).

This rare, saxicolous species is known from one locality in south-eastern N.S.W. Also in Brazil, Papua New Guinea and the Hawaiian Islands.

N.S.W.: Bundeena, Royal Natl Park, *J.A.Elix* 2299 (CANB).

Pertusaria consanguinea resembles the more common *P. lophocarpa*, but differs from that species in the inconspicuous ostioles and the presence of 2-*O*-methylperlatolic acid as a major component in place of 2'-*O*-methylperlatolic in *P. lophocarpa*.

Pertusaria dissita Elix & A.W.Archer, in J.A.Elix, W.M.Malcolm & A.W.Archer, *Mycotaxon* 53: 273 (1995)

T: Mt McLachlan, 7 km NW of Pine Creek, N.T., 13°47'S, 131°47'E, 20 July 1991, *J.A.Elix* 28213; holo: CANB.

Illustration: J.A.Elix *et al.*, *op. cit.* 277, fig. 1.

Thallus dull yellowish green to pale olive-green, areolate and cracked, subtuberculate and dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, scattered, rarely confluent, flattened-hemispherical, concolorous with the thallus, usually constricted at the base, 0.8–1.5 mm diam. Ostioles inconspicuous, black, punctiform, surrounded by a pale yellow opaque zone, c. 0.2 mm diam., 1 or 2 per verruca. Ascospores 8 per ascus, irregularly biseriolate, ellipsoidal, smooth, (60–) 70–90 (–105) × 30–40 (–45) µm.

Chemistry: Thallus K–, KC+ orange, C+ orange, Pd–; containing stictic acid (major), thiophanic acid (major), 2-chloro-6-*O*-methylnorlichexanthone (minor), lichexanthone (trace to minor), constictic acid (minor), hypostictic acid (minor), 4-chloro-6-*O*-methylnorlichexanthone (trace), cryptostictic acid (trace), hypoconstictic acid (trace) and menegazziaic acid (trace).

This rare, endemic, saxicolous species is known from two localities in northern N.T.

N.T.: Green Ant Ck, 35 km SSE of Adelaide River settlement, *J.A.Elix* 28191 (CANB).

Pertusaria dissita is characterised by the dull, predominantly yellowish green thallus, asci with 8 biseriolate ascospores and the distinctive thallus chemistry.

Pertusaria hadrocarpa Zahlbr., in C.Skottsberg, *Nat. Hist. Juan Fernandez & Easter Island* 29(11): 376 (1924)

T: Pico Central, Cordón Salsipuedes, Masatierra [Más á Tierra, Robinson Crusoe Is.], Islas Juan Fernández, Chile, alt. 365 m, 17 Dec. 1916, C. & I.Skottsberg; lecto: GB, *vide* A.W.Archer, *Biblioth. Lichenol.* 69: 73 (1997); syn: GB.

Pertusaria asperata A.W.Archer, *Mycotaxon* 45: 417 (1992). T: by side of track near Crawford R., Myall River State Forest, c. 10 km W of Bulahdelah, N.S.W., 32°25'S, 152°06'E, 20 June 1991, A.W.Archer P188; holo: NSW.

Illustration: A.W.Archer, *Mycotaxon* 45: 419, fig. 1 (1992), as *P. asperata*.

Thallus off-white to pale greyish white, thin, cracked to areolate, subtuberculate and dull. Soredia and isidia absent. Apothecia numerous, inconspicuous, scattered, rarely confluent, verruciform, concolorous with the thallus, flattened-hemispherical or concave above and constricted at the base, 0.8–1.5 mm diam. Ostioles conspicuous, dark brown to black, 1 per verruca. Ascospores 8 per ascus, irregularly biseriolate, ellipsoidal to subfusiform, smooth, 112–125 × 37–50 µm.

Chemistry: Thallus K–, KC–, C–, Pd–, UV+ yellow; containing lichexanthone (major), stictic acid (major), constictic acid (trace) and ±menegazziaic acid (trace).

A very rare, saxicolous species in eastern N.S.W.; also in Lord Howe Is. and the south-eastern Pacific Ocean.

Pertusaria hadrocarpa is characterised by asci with 8 biseriolate ascospores and by the chemistry of the thallus. Chemistry and ascospore size distinguish *P. hadrocarpa* from the somewhat similar *P. petrophytes* which contains thiophanic acid and has 60–85 µm long ascospores.

Pertusaria hypoxantha Malme, *Ark. Bot.* 28A(9): 23 (1936)

T: Serra da Chapada, Mato Grosso, Brazil, June 1894, G.O.A.Malme 3932; holo: S.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 163, fig. 65 (1997).

Thallus dull to bright yellow, areolate and cracked, smooth. Soredia and isidia absent. Apothecia uncommon, verruciform, scattered, rarely confluent, concolorous with the thallus, slightly flattened-hemispherical, becoming constricted at the base, 0.6–1.0 mm diam.

Ostioles inconspicuous, pale to dark yellowish brown, 1 per verruca. Ascospores 8 per ascus, irregularly uniseriate, ellipsoidal, rarely subfusiform, smooth, 55–75 (–90) × 25–37 µm.

Chemistry: Thallus K–, KC+ orange, C+ orange, Pd– or Pd+ weak yellow; containing thiophanic acid (major), stictic acid (major), constictic acid (minor), ±lichexanthone (minor to trace) and 2-chloro-6-*O*-methylnorlichexanthone (trace).

A common and conspicuous, saxicolous species in eastern Qld and N.S.W.; also in New Zealand and Brazil.

Qld: Mt Stuart, 10 km SSW of Townsville, *J.A.Elix 21230* (CANB); Jim Crow Mtn, 25 km NE of Rockhampton, *G.Rambold 4474* (M); Mt Catherina, 10 NE of Ingham, *H.Streimann 28302* (CANB). N.S.W.: Broken Head, 8 km S of Byron Bay, *J.A.Elix 21253* (CANB).

Pertusaria hypoxantha is characterised by the yellow thallus, 8-spored asci and the presence of thiophanic and stictic acids in the thallus. It is distinguished from *P. xanthodactylina* by the absence of isidia and from *P. xanthoplaca* by the absence of soredia.

***Pertusaria lavata* Müll.Arg., *Flora* 67: 462 (1884)**

T: New Zealand, *s. loc.*, 1883, *C.Knight s.n.*; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 92, fig. 25 (1997).

Thallus pale greyish white to pale fawn, thick, coarsely areolate and cracked, smooth and dull, lacking soredia and isidia. Apothecia numerous, verruciform, crowded, often confluent, concolorous with the thallus, markedly flattened-hemispherical, 0.7–1.0 mm diam. Ostiole conspicuous, black, punctiform, surrounded by a pale translucent zone, 1 per verruca. Ascospores (6–) 8 per ascus, predominantly biseriata, ellipsoidal to subfusiform, smooth, 85–105 × 30–40 µm.

Chemistry: Thallus K–, KC–, C–, Pd–; containing 4,5-dichlorolichexanthone (major), 2'-*O*-methylperlatolic acid (major) and ±confluent acid (minor).

An uncommon, predominantly coastal, saxicolous species in eastern Qld and N.S.W.; also in Lord Howe Is. and New Zealand.

Qld: Castle Crag, Lamington Natl Park, *S.Brownlie A90a* (MEL). N.S.W.: near Point Lookout, New England Natl Park, 80 km E of Armidale, *A.W.Archer P372* (NSW); Boulder Bay, 3 km S of Tathra, *A.W.Archer 531* (NSW).

This lichen is characterised by flattened verrucae, asci with mostly 8 biseriata ascospores and a distinctive chemistry. The chemically similar *P. lophocarpa* has conspicuous, raised verrucae and smaller, uniseriate ascospores.

***Pertusaria lophocarpa* Körb., *Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss.* 2: 34 (1862)**

T: Vic., *s. loc.*, *Hochstetter s.n.*; holo: WRS�; iso: M.

Pertusaria glebosa Müll.Arg., *Flora* 65: 485 (1882). T: Grampians, Vic., *D.Sullivan 14*; holo: G.

Pertusaria diffracta Müll.Arg., *Bull. Herb. Boissier* 1: 43 (1893). T: Lorne, Vic., May 1887, *F.R.M.Wilson 1055*; holo: G; iso: NSW L4436.

Pertusaria arenacea Müll.Arg., *Hedwigia* 34: 29 (1895). T: Lorne, Vic., May 1887, *F.R.M.Wilson 1056*; holo: G; iso: NSW L4477.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 106, fig. 31 (1997).

Thallus off-white to pale fawn, thin and effuse to thick, becoming cracked and areolate, smooth and dull. Soredia absent; isidia very rare. Apothecia conspicuous, verruciform, sparse and scattered to numerous and crowded, rarely confluent, flattened to irregularly hemispherical, often with concave tops, 1–2 (–3) mm diam. Ostioles conspicuous, black, 1–3 (or 4) per verruca, occasionally sunken. Ascospores (6–) 8 per ascus, uniseriate, ellipsoidal, smooth, 45–75 × 25–40 µm. Pycnidia uncommon, black, immersed, 1–5 per verruca, 0.05–0.15 mm diam. Conidia narrowly fusiform, slightly curved, 5–8 × 1 µm.

Chemistry: Thallus K–, KC–, C–, Pd–, UV+ dull orange; containing 4,5-dichlorolichexanthone (major), 2'-*O*-methylperlatolic acid (major), ±confluent acid (minor); rarely with 2-*O*-methylperlatolic acid (minor) in place of confluent acid.

A widely distributed, saxicolous species in S.A., N.S.W., A.C.T., Vic. and Tas.; also in Macquarie Is. and New Zealand.

S.A.: Kangaroo Is., *H.Streimann* 55116A (CANB). N.S.W.: Kangaroo R., 22 km NW of Nowra, *D.Verdon* 3065 (CANB). A.C.T.: Mt Aggie, *J.A.Elix* 5848 (CANB). Vic.: Basalt Hill, Bogong High Plains, *R.B.Filson* 9570 (MEL). Tas.: Stony Pt, near Montagu, *G.Kantvilas* 369/81 (BM, HO).

The species is characterised by conspicuous verrucae, 8 uniseriate ascospores and by its distinctive chemistry. It is distinguished from the chemically similar *P. lavata* by the uniseriate ascospores which in *P. lavata* are biseriate and slightly larger.

***Pertusaria macra* Müll.Arg., *Bull. Herb. Boissier* 3: 639 (1895)**

T: Thursday Is., Qld, 1887, *C.Knight* 262; holo: G.

Thallus greyish white, thin, minutely cracked and areolate, smooth and dull, lacking soredia and isidia. Apothecia numerous, conspicuous, verruciform, scattered, flattened-hemispherical, 0.3–0.5 mm diam. Ostiole conspicuous, black, sunken, disc-like, 1 per verruca, 0.2–0.4 mm diam. Ascospores 8 per ascus, irregularly biseriate, ellipsoidal, smooth, 30–36 × 17–20 µm.

Chemistry: Thallus K–, KC–, C–, Pd–; containing stictic acid (minor) and constictic acid (trace).

This very rare saxicolous species is known only from the type locality in north-eastern Qld.

Pertusaria macra is characterised by having 8-spored asci, verruciform apothecia with conspicuous, black, sunken ostioles, and its distinctive thallus chemistry. It resembles *P. erumpescens* Nyl., from New Zealand, but that species contains norstictic acid.

***Pertusaria melanospora* Nyl., *Ann. Sci. Nat., Bot.*, sér. 4, 3: 159 (1855)**

T: Quilmenco, Chile, *C.Gay s.n.*; lecto: H-NYL 23603, *vide* A.W.Archer & J.A.Elix, *New Zealand J. Bot.* 31: 111–116 (1993); isolecto: H-NYL 23604.

Pertusaria crassilabra Müll.Arg., *Hedwigia* 32: 126 (1893). T: Loutit Bay, [near Lorne], Vic., 1891, *Leuhmann s.n.*; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 106, fig. 33 (1997).

Thallus thick, pale yellow to dull yellow-brown, somewhat granular, minutely cracked and areolate, smooth. Soredia and isidia absent. Apothecia conspicuous, verruciform, scattered, immersed or flattened-hemispherical with constricted bases, concolorous with the thallus, 0.5–1.5 mm diam., the centre occasionally depressed. Ostiole black, conspicuous, becoming pseudolecanorine, 1 per verruca, 0.2–0.5 mm diam. Ascospores 8 per ascus, irregularly biseriate, ellipsoidal, smooth, colourless or occasionally pale bluish grey or brown, 60–75 × 30–37 µm.

Chemistry: Thallus K–, KC+ yellow-orange, C+ orange, Pd–; containing arthothelin (major) and 4,5-dichloronorlichexanthone (minor).

A rare, saxicolous species in coastal areas of S.A., N.S.W. and Vic.; also in New Zealand, Peru and South Africa.

S.A.: Dudley Penin., Hog Bay, Kangaroo Is., *J.A.Elix* 19682 (CANB). N.S.W.: Kiama, *W.H.Ewers* 4956 (CANB).

The lichen is characterised by asci with 8 biseriate ascospores, conspicuous, black ostioles and the presence of arthothelin (2,4,5-trichloronorlichexanthone) in the thallus. The ascospores are occasionally pale bluish grey or brown.

***Pertusaria paratropa* Müll.Arg., *Bull. Herb. Boissier* 3: 639 (1895)**

T: Lorne, Vic., May 1887, *F.R.M.Wilson* 528; holo: G; iso: NSW L4497, L4498.

Thallus greyish white, cracked to areolate, smooth and dull. Soredia and isidia absent. Apothecia numerous, verruciform, scattered, strongly flattened-hemispherical, 0.5–1.0 mm

diam. Ostioles conspicuous, black, pseudolecideine, 1 (–3) per verruca. Ascospores 8 per ascus, irregularly biseriate, ellipsoidal, smooth, 37–55 × 20–30 µm.

Chemistry: Thallus K–, KC–, C–, Pd–; no lichen compounds detected.

An uncommon saxicolous species in south-eastern Qld, southern N.S.W. and Vic.; endemic.

Qld: Mt Cordeaux, Cunninghams Gap Natl Park, *J.Hafellner 15367* (GZU). N.S.W.: Tilba Tilba, 13 km SSW of Narooma, *J.A.Elix 21611* (CANB); Round Mtn, Mount Kosciuszko Natl Park, *J.A.Elix 19088* (CANB). Vic.: Allansford Bridge, 10 km E of Warrnambool, *W.H.Ewers s.n.* (CANB); Mt Eccles, 100 km SE of Melbourne, *W.H.Ewers s.n.* (CANB).

The lichen is characterised by 8-spored asci, conspicuous black ostioles and the absence of lichen compounds. It resembles *P. erubescens*, but that species contains norstictic acid.

***Pertusaria petrophyes* C.Knight, *Trans. Linn. Soc. London*, ser. 2, 2: 47 (1881)**

T: [near Sydney], N.S.W., *C.Knight s.n.*; holo: WELT; iso: H-NYL 23608.

Pertusaria leucoxantha Müll.Arg., *Bull. Herb. Boissier* 3: 637 (1895). T: Thursday Is., Qld, 1887, *C.Knight 280*; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 132, fig. 43 (1997).

Thallus pale fawn or pale yellowish green, thin to effuse, smooth and dull. Soredia and isidia absent. Apothecia few to numerous, verruciform, occasionally confluent, flattened-hemispherical or irregular in outline, 0.5–1.5 mm diam. Ostioles black, 1 or 2 per verruca, sometimes raised. Ascospores 8 per ascus, irregularly uniseriate, ellipsoidal, smooth, 60–85 × 25–45 µm.

Chemistry: Thallus K–, KC+ weak orange, C+ weak orange, Pd–; containing thiophanic acid (major), 2-*O*-methylperlatolic acid (major) and 2-chloro-6-*O*-methylnorlichexanthone (trace).

A widely distributed, saxicolous species found in Qld, N.S.W. and Vic.; also in Papua New Guinea, Lord Howe Is. and New Zealand.

Qld: Pine Mtn, 24 km NE of Rockhampton, *J.A.Elix 34717* (CANB); Cunninghams Gap Natl Park, *J.Hafellner 15304* (GZU). N.S.W.: Waihou Trig., 25 km NW of Coffs Harbour, *D.Verdon 3796* (CANB); Hat Head summit, Hat Head Natl Park, *A.W.Archer P386* (NSW). Vic.: Mallacoota Inlet, Mallacoota, *A.W.Archer P548* (NSW).

The species is characterised by the 8-spored asci and the presence of thiophanic and 2-*O*-methylperlatolic acids in the thallus. *Pertusaria petrophyes* C.Knight var. *hokiensis* Vain. is synonymous with the corticolous, Japanese species *P. composita* Zahlbr.

***Pertusaria thula* A.W.Archer, *Mycotaxon* 41: 246 (1991)**

T: The Tip, Cape York Penin., Qld, 26 Sept. 1976, *U.Allen s.n.*; holo: HO 50934.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 154, fig. 57 (1997).

Thallus dull yellow, areolate and cracked, thin. Soredia and isidia absent. Apothecia conspicuous, verruciform, flattened-hemispherical, concolorous with the thallus, constricted at the base, sometimes confluent, 0.8–2.0 mm diam. Ostioles conspicuous, subpapilliform, concolorous with the verrucae, 1–4 per verruca. Ascospores 8 per ascus, irregularly biseriate, broadly ellipsoidal, smooth, 60–85 × 37–50 µm.

Chemistry: Thallus K–, KC+ yellow-orange, C+ yellow-orange, Pd–; containing thiophanic acid (major), asemone [4,5,7-trichloronorlichexanthone] (minor), arthothelin (minor) and 6-*O*-methylasemone (trace).

A endemic, saxicolous species in Cape York Peninsula, north-eastern Qld.

Qld: Cape York, *S.Jacobs 5463, 5465* (NSW).

The species is characterised by 8-spored asci and the presence of thiophanic acid. It is distinguished from the somewhat similar *P. hypoxantha* by the absence of thiophanic acid

and the arrangement of ascospores in the ascus. *Pertusaria thula* is chemically similar to *P. melanospora*, but that species lacks thiophanic acid and has a more southerly distribution.

Pertusaria xanthodactylina A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 165 (1997)

T: Cooktown road, 3 km NW of Mt Malloy, Qld, 16°40'S, 145°19'E, 3 July 1984, *J.A.Elix 17184*; holo: CANB.

Thallus dull to bright yellow, areolate and cracked, smooth. Soredia absent. Isidia simple, scattered, 0.2–0.4 mm tall, 0.05–0.10 mm wide. Apothecia rare, verruciform, scattered, rarely confluent, concolorous with the thallus, slightly flattened-hemispherical, becoming constricted at the base, 0.5–1.0 mm diam. Ostiole inconspicuous, pale to dark yellowish brown, 1 per verruca. Ascospores 8 per ascus, irregularly uniseriate, ellipsoidal, rarely subfusiform, smooth, 50–75 (–90) × 25–37 µm.

Chemistry: Thallus K–, KC+ orange, C+ orange, Pd– or Pd+ weak yellow; containing thiophanic acid (major), stictic acid (major), constictic acid (minor), 2-chloro-6-*O*-methyl-norlichexanthone (trace) and ±lichexanthone (minor to trace).

A locally common, endemic, saxicolous species in north-eastern Qld.

Qld: Shipton Flat Rd, 44 km S of Cooktown, *H.Streiman 57517* (CANB); Mt Leswell, 32 km S of Cooktown, *J.A.Elix 17353* (CANB); The Black Gap, 21 km SSW of Cooktown, *J.A.Elix 17337* (CANB); Mt Slopeway, 23 km S of Cardwell, *H.Streimann 45411* (CANB); Mt Finnegan, 39 km S of Cooktown, *H.Streimann 57610* (CANB).

Pertusaria xanthodactylina is characterised by the yellow isidiate thallus, the presence of thiophanic and stictic acids and, when fertile, 8-spored asci.