

GROUP D

[Thallus corticolous; apothecia verruciform; asci 2-spored]

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Pertusaria cicatricosa Müll.Arg., *Proc. Roy. Soc. Edinburgh* 11: 461 (1882)

T: Socotra, [Yemen], 1876, *Balfour s.n.*; lecto: G; fide A.W.Archer, *Mycotaxon* 44: 17 (1992).

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 49, fig. 11 (1997).

Thallus pale yellowish white to pale yellowish green, slightly tuberculate and cracked, smooth and dull. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, concolorous with the thallus, crowded, sometimes confluent, flattened-hemispherical, often irregular in outline, occasionally becoming constricted at the base, 0.8–1.5 mm diam. Ostioles inconspicuous, pale brown or translucent, 0.1–0.2 mm diam., 1 (–3) per verruca, sometimes slightly sunken. Ascospores 2 per ascus, ellipsoidal, rough, 100–150 (–200) × 35–50 µm.

Chemistry: Thallus K–, KC–, C–, Pd–; containing 2,4,5-trichlorolichexanthone (major), stictic acid (major), 2,4-dichlorolichexanthone (minor), 2-5-dichlorolichexanthone (minor), ±2-chlorolichexanthone (trace) and constictic acid (trace).

A tropical to subtropical, corticolous species that occurs in eastern Qld; also in Socotra, Sri Lanka, Mauritius, Indonesia, Papua New Guinea, New Caledonia, Vanuatu and Fiji.

Qld: Ravenshoe S.F., 18 km SE of Ravenshoe, *J.A.Elix 16157* (CANB); 2 km N of Dunwich, North Stradbroke Is., *R.W.Rogers* (BRI 2052); Tingalpa Ck, Brisbane, Aug. 1896, *F.R.M.Wilson* (NSW); Noosa Heads Natl Park, *J.A.Elix 10380* (CANB).

The species is characterised by asci with 2 rough-walled ascospores and the presence of tri- and dichlorolichexanthenes and stictic acid in the thallus. It can be separated from the chemically similar *P. pertusella* by the rough ascospores (smooth in *P. pertusella*).

Pertusaria elliptica Müll.Arg., *Bull. Herb. Boissier* 3: 635 (1895)

T: Goodna, Qld, 1893, *J.Shirley 1754 p.p.*; holo: G.

Thallus thin, off-white or pale grey to pale olive-green, smooth or slightly rough, dull. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, scattered, slightly flattened-hemispherical, rounded, elongate or irregular in outline, becoming constricted at the base and concave above, 0.5–1.5 mm diam. Ostioles conspicuous, black, sometimes in a grey translucent zone, 1 or 2 per verruca. Ascospores uniseriate, rough-walled.

Chemistry: Thallus K–, KC–, C–, Pd–; containing 2,5-dichlorolichexanthone (major), 2,4,5-trichlorolichexanthone (major), ±stictic acid (major), 2-chlorolichexanthone (minor), 2'-O-methylperlatolic acid (minor), 2-O-methylperlatolic acid (minor), 2,4-dichlorolichexanthone (trace), ±planaic acid (trace), constictic acid (minor), 4,5-dichlorolichexanthone (trace) and menegazziaic acid (trace).

There are two varieties of this corticolous species.

Asci usually with 3 or 4 ascospores; ascospores 80–110 µm long **a. var. elliptica**
Asci with 2 ascospores; ascospores (130–) 140–175 (–190) µm long **b. var. bispora**

a. Pertusaria elliptica Müll.Arg. var. **elliptica**

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 61, fig. 15 (1997).

Ascospores (2 or) 3–4 per ascus, elongate-ellipsoidal to subfusiform, 80–110 × 30–45 µm.

A tropical and subtropical variety that occurs in northern N.T., eastern Qld and north-eastern N.S.W.; also in Lord Howe Island, Papua New Guinea and New Caledonia.

N.T.: Litchfield Park, *J.A.Elix 27516, 27627, 27628* (CANB). Qld: Finch Bay, 2 km E of Cooktown, *D.Verdon 5437* (CANB); Rainbow Falls, 36 km SE of Blackwater, *J.A.Elix 34365* (CANB). N.S.W.: Little Bay, 30 km NE of Kempsey, *A.W.Archer P634* (NSW); near Diamond Head, Crowdy Bay Natl Park, *A.W.Archer P609* (NSW).

b. *Pertusaria elliptica* var. *bispora* Elix & A.W.Archer, in J.A.Elix, W.M.Malcolm & A.W.Archer, *Mycotaxon* 53: 275 (1995)

T: by side of Hacking R., c. 37 km SSW of Sydney, N.S.W., 34°07'S, 151°03'E, 10 Feb. 1992, A.W.Archer P265; holo: NSW.

As for var. *elliptica* but with ascospores 2 per ascus, ellipsoidal, (130–) 140–175 (–190) × 40–50 µm.

An uncommon, endemic variety in eastern N.S.W.; its distribution is more southerly than that of var. *elliptica*.

N.S.W.: Twelve-Mile Rd, near Boyd Lookout, Jerrawangla S.F., A.W.Archer P325 (NSW); near German Point Rd, Watagan S.F., c. 38 km WSW of Newcastle, A.W.Archer P685 (NSW); Olney S.F., c. 5 km NNW of Coorabong, A.W.Archer P696 (NSW).

The external morphology and chemistry of the two varieties are identical; they differ only in the size and number of ascospores.

Pertusaria epacrospora A.W.Archer, *Mycotaxon* 41: 225 (1991)

T: Park Beach, Coffs Harbour, N.S.W., 29 June 1977, J.A.Elix 3427b; holo: CANB.

Thallus thin, pale yellow-green, cracked to areolate, subtuberculate and dull. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, crowded, occasionally confluent, flattened-hemispherical, 0.4–0.8 mm diam. Ostiole inconspicuous, with a translucent margin, 1 per verruca. Ascospores 2 per ascus, fusiform, smooth, 125–150 (–180) × 35–45 µm.

Chemistry: Thallus K–, KC+ yellow-orange, C+ yellow-orange, Pd–; containing thiophanic acid (major), stictic acid (major), constictic acid (minor) and hypostictic acid (trace).

This very rare, endemic, corticolous species is known only from the type locality in north-eastern N.S.W.

Pertusaria epacrospora resembles the more common *P. thiospoda*, but the former has larger, fusiform ascospores.

Pertusaria hartmannii Müll.Arg., *Flora* 65: 485 (1882)

Pertusaria trypteliiformis Nyl. var. *hartmannii* (Müll.Arg) Müll.Arg., *Flora* 67: 351 (1884). T: Toowoomba, Qld, C.Hartmann s.n.; holo: G.

Pertusaria muelleriana Zahlbr., *Cat. Lich. Univ.* 5: 181 (1928); *P. albinea* Müll.Arg., *Bull. Herb. Boissier* 3: 635 (1895), *nom. illeg., non P. albinea* Tuck., *Proc. Amer. Acad. Arts Sci.* 12: 177 (1877). T: Goodna, Qld, 1893, J.Shirley 1754 p.p.; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 76, fig. 21 (1997).

Thallus thin, pale greyish white to greenish white, continuous or slightly cracked, smooth to somewhat wrinkled, dull. Soredia and isidia absent. Apothecia conspicuous, scattered, occasionally confluent, verruciform, slightly flattened-hemispherical or irregular in outline, becoming constricted at the base, 0.5–1.5 (–2.5) mm diam. Ostioles conspicuous, black, 1–8 per verruca. Ascospores 2 per ascus, elongate-ellipsoidal, smooth, 120–170 (–200) × 35–60 µm.

Chemistry: Thallus K+ yellow then red, KC–, C–, Pd+ yellow; containing norstictic acid (major), ±perlatolic acid (major to minor), connorstictic acid (trace), ±stenosporic acid (trace) and ±lichexanthone (trace).

An endemic, corticolous species in eastern Qld.

Qld: Two-Mile Falls, 29 km SE of Blackwater, J.A.Elix 34419 (CANB); Mt Fox, 43 km S of Ingham, J.A.Elix 20365 (CANB); Noosa R., 70 km S of Gympie, J.Hafellner 18278 (GZU); Weyba Ck, S of Noosa Heads, G.N.Stevens 2373 (BRI).

The species is characterised by 2-spored asci and the presence of norstictic acid in the thallus, usually with perlatolic acid. Externally, it resembles *P. thwaitesii*, but that species

contains protocetraric acid and has rough, rather than smooth, ascospores. The two can be readily differentiated by their reaction with KOH.

Pertusaria irregularis Müll.Arg., *Bull. Herb. Boissier* 3: 638 (1895)

T: Thursday Is., Qld, *C.Knight* 31 p.p.; lecto: G, *fide* A.W.Archer, *Telopea* 4: 170 (1991).

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 76, fig. 24 (1997).

Thallus pale yellowish white, thick, coarsely cracked and areolate, smooth and dull. Soredia and isidia absent. Apothecia verruciform, inconspicuous, flattened-hemispherical, 0.8–1.0 mm diam. Ostioles conspicuous, black, 1–3 per verruca. Ascospores 2 per ascus, fusiform, smooth, (120–) 130–155 × 35–47 µm.

Chemistry: Thallus K–, KC–, C–, Pd–; containing 4,5-dichlorolichexanthone (major) and ±2,4,5-trichlorolichexanthone (trace).

Uncommon in north-eastern Qld where it grows in mangroves; also in Fiji, New Caledonia and Papua New Guinea.

Qld: Endeavour R., 11 km from Cooktown, *D.Verdon* 5432 (CANB); Ross Ck, Yeppoon, *J.A.Elix* 34611 (CANB).

The species is characterised by asci with 2 smooth, fusiform ascospores and the presence of 4,5-dichlorolichexanthone as the only major lichen compound.

Pertusaria isidiosa A.W.Archer, *Mycotaxon* 41: 228 (1991)

T: Weyba Ck, SW of Noosa Heads, c. 70 km SE of Gympie, Qld, 26°24'S, 153°05'E, 27 July 1986, *J.Hafellner* 17951; holo: GZU.

Illustration: A.W.Archer, *op. cit.* 229, fig. 5.

Thallus yellowish white, thin, dull. Soredia absent. Isidia initially simple, becoming coralloid, to 0.4 mm long, c. 0.05 mm wide, scattered to dense. Apothecia verruciform, hemispherical, constricted at the base, sometimes confluent, shortly isidiate, 0.8–1.5 mm diam. Ostioles inconspicuous, pale. Ascospores 2 per ascus, fusiform, smooth, 100–112 × 30–35 µm.

Chemistry: Thallus K–, KC–, C–, Pd–; containing lichexanthone (major), 2'-*O*-methylperlatolic acid (major), stictic acid (major) and constictic acid (trace).

This endemic, corticolous species is known from mangroves in south-eastern Qld.

Qld: North Stradbroke Is., *J.Hafellner* 19214, 19240 (GZU); Tandora, c. 25 km ENE of Maryborough, *J.Hafellner* 18214 (GZU).

Pertusaria isidiosa is characterised by asci with 2 ascospores and lichexanthone, 2'-*O*-methylperlatolic acid and stictic acid in the thallus. Thus, it is distinguished from *P. subisidiosa*, the only other fertile, isidiate, corticolous species in Australia, which has 4-spored asci and lacks lichexanthone.

Pertusaria malabara A.W.Archer & Elix, *Telopea* 6: 19 (1994)

T: Neds Beach road at Malabar Hill Track, Lord Howe Island, 32°31'16"S, 159°03'50"E, alt. 10 m, on crown of *Cryptocarya* in disturbed lowland forest, 22 June 1992, *J.A.Elix* 32875; holo: CANB.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 16, fig. 4.

Thallus pale olive-green, somewhat cracked, subtuberculate and dull, lacking isidia and soredia. Apothecia verruciform, conspicuous, numerous, flattened-hemispherical, becoming constricted at the base, concolorous with the thallus, 0.5–1.0 mm diam. Ostioles conspicuous, pale yellow, translucent, becoming concave, 0.2–0.3 mm diam., 1–4 per verruca. Ascospores 2 per ascus, ellipsoidal, smooth, 90–100 × 30–37 µm.

Chemistry: Thallus K–, KC+ weak orange, C+ weak orange, Pd–; containing thiophanic acid (major), 6-*O*-methylarthothelin (major), thiophanic acid (minor), 2,4-dichloronorlichexanthone (trace), 4,5-dichloronorlichexanthone (trace), stictic acid (minor) and constictic acid (trace).

A endemic corticolous species known only from Lord Howe Island.

The species is characterised by its bisporous asci and the presence of chlorinated norlichexanthones and stictic acid. The occurrence of stictic acid with thiophanic acid appears to be unique. *Pertusaria malabara* resembles *P. saltuensis*, but the latter lacks 6-*O*-methylarthonelin and stictic acid.

Pertusaria meeana A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 102 (1997)

T: Loveday Rd, 2 km N of Forest Stn, Mount Mee State Forest, 60 km NW of Brisbane, Qld, 27°04'S, 152°45'E, 28 Apr. 1996, A.W.Archer P830; holo: NSW.

Thallus pale olive-green, rough and cracked, lacking soredia and isidia. Apothecia numerous, inconspicuous, verruciform, flattened-hemispherical, often confluent, 0.6–1.0 mm diam. Ostiole inconspicuous, punctiform, translucent, 1 per verruca. Ascospores 2 per ascus, smooth, ellipsoidal to subfusiform, 105–135 × 30–40 µm.

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

This endemic, corticolous species is known only from the type locality in south-eastern Qld.

Pertusaria meeana is characterised by asci with 2 smooth ascospores and the presence of 4,5-dichlorolichexanthone and 2-*O*-methylperlatolic acid in the thallus. This chemistry distinguishes it from other Australian species with 2-spored asci.

Pertusaria melaleucoides Müll.Arg., *Flora* 67: 284 (1884)

T: [probably Wellington], New Zealand, 1883, *C.Knight s.n.*; holo: G.

Pertusaria atropunctata A.W.Archer, *Mycotaxon* 41: 224 (1991). T: Buckenbowra R. estuary, 7.5 km W of Batemans Bay, N.S.W., 29 May 1983, *J.A.Elix 11004*; holo: CANB.

Illustration: A.W.Archer, *op. cit.* 229, fig. 1, as *P. atropunctata*.

Thallus greyish white, areolate and cracked, dull, lacking soredia and isidia. Apothecia verruciform, immersed to flattened-hemispherical, concolorous with the thallus, 0.5–1.0 mm diam. Ostioles conspicuous, black, 1–4 per verruca, fusing to form an irregular black pseudolecideine disc 0.3–0.6 mm diam. Ascospores 2 per ascus, elongate-ellipsoidal, smooth, 85–100 (–120) × 30–40 µm.

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

An uncommon, corticolous species in south-eastern N.S.W.; also in New Zealand. Usually found on *Avicennia* at sea level.

N.S.W.: Narrawallee Inlet, c. 55 km N of Batemans Bay, A.W.Archer P280 (CANB, NSW); Batemans Bay, *J.A.Elix 23342* (CANB).

Characterised by the 2-spored asci, conspicuous, black ostioles and the absence of lichen compounds. This lichen bears a superficial resemblance to some species of *Lecidea* (Lecideaceae).

Pertusaria neolecanina Lumbsch & Nash, in H.T.Lumbsch, T.H.Nash & M.I.Messuti, *Bryologist* 102: 229 (1999)

T: 3 km E of Santa Anna, Sonora, Mexico, *T.H.Nash 11030*; holo: ASU

Pertusaria alloluteola A.W.Archer & Elix, in J.A.Elix, S.Jariangprasert & A.W.Archer *Telopea* 12: 264 (2008). T: Goonoo S.F., 23 km NNE of Dubbo, N.S.W., 32°04'16"S, 148°42'53"E, alt. 330 m, 11 Oct. 2005, *J.A.Elix 36773*; holo: CANB.

Illustrations: H.T.Lumbsch, T.H.Nash & M.I.Messuti, *op. cit.* 224, figs 17, 18; J.A.Elix, S.Jariangprasert & A.W.Archer, *op. cit.* 276, fig. 1, as *P. alloluteola*.

Thallus pale yellow-green, thin, cracked, smooth and dull. Apothecia conspicuous, scattered, concolorous with the thallus, verruciform, flattened-hemispherical, not constricted at the base, 0.5–0.8 mm diam.; ostioles black, conspicuous, often 1 per verruca but occasionally up to 5 per verruca. Asci amyloid with a distinctive ocular chamber; hymenium non-amyloid. Ascospores 2 per ascus, ellipsoidal, smooth, 95–118 × 35–40 µm.

Chemistry: containing thiophanic acid (minor), 2-chloro-6-*O*-methylnorlichexanthone (trace), 4-chloro-6-*O*-methylnorlichexanthone (trace) and norstictic acid (major).

An uncommon corticolous species in south-western W.A. and central-western N.S.W.; grows on *Melaleuca* and *Allocasuarina*. Also in *Quercus* in Mexico.

W.A.: Gwambygine Nature Reserve, 11 km S of York, *J.A.Elix* 31736, 37413 (CANB); Kendenup, [c. 7 km NNW of Albany], *R.F.Allen* 10 (PERTH).

Pertusaria neolecanina is characterised by the yellowish thallus, black ostioles, bisporous asci and the presence of thiophanic acid and norstictic acid. The somewhat similar *P. trimera* has 3- or 4-spored asci. It resembles the chemically similar, 2-spored *P. luteola* Boqueras, from Spain, but the Australian lichen has larger ascospores (70–95 × 25–35 µm in *P. luteola*) and more conspicuous ostioles.

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

T: Mauritius, 1876, *Robillard s.n.*; holo: G.

Pertusaria plicatula Müll.Arg., *Bull. Herb. Boissier* 3: 635 (1895). T: Qld, *s. loc.*, 1887, *C.Knight* 41 *p.p.*; holo: G.

Pertusaria straminea Müll.Arg., *Bull. Herb. Boissier* 3: 638 (1895). T: Thursday Is., Qld, 1887, *C.Hartmann s.n.*; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 123, fig. 42 (1997).

Thallus off-white to pale yellow-green, areolate and cracked, slightly wrinkled and dull. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, occasionally confluent, slightly flattened-hemispherical, becoming constricted at the base, 0.5–1.0 mm diam. Ostioles inconspicuous, pale to dark brown, 1–5 per verruca, often slightly sunken. Ascospores 2 per ascus, elongate-ellipsoidal, smooth, 100–140 (–160) × 30–45 µm.

Chemistry: Thallus K–, KC–, C–, Pd–; containing 2,4,5-trichlorolichexanthone (major), 2,4-dichlorolichexanthone (major), 2,5-dichlorolichexanthone (major), stictic acid (major) and constictic acid (trace).

An uncommon, corticolous species in northern N.T. and north-eastern Qld; also in India, Sri Lanka and Vanuatu.

N.T.: Darwin R., 60 km S of Darwin, *N.Sammy* 87/035 (DNA). Qld: Kuranda Ra., NW of Cairns, *K.Kalb* 19915 (Herb. K.Kalb); Mount Archer Environmental Park, 7 km NE of Rockhampton, *J.A.Elix* 34534 (CANB).

The species is characterised by asci with 2 smooth-walled ascospores and the presence of tri- and dichlorolichexanthenes and stictic acid in the thallus. It is differentiated from the chemically similar *P. cicatricosa* by the rough-walled ascospores of the latter.

***Pertusaria porinella* Nyl., *Ann. Sci. Nat., Bot.*, sér. 3, 19: 321 (1863)**

T: Tampico, Mexico, 1858, *Uzac s.n.*; holo: H-NYL 22966.

Thallus thin, dull yellowish white to off-white, smooth. Soredia and isidia absent. Apothecia numerous, verruciform, concolorous with the thallus, scattered, rarely confluent, flattened-hemispherical, occasionally becoming constricted at the base, 0.4–0.8 mm diam. Ostiole inconspicuous, translucent, 1 per verruca. Ascospores 2 per ascus, ellipsoidal, smooth, 80–105 × 25–40 µm.

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

This uncommon, corticolous species is found in mangroves in eastern Qld and N.S.W.; also in Mexico.

Qld: Noosa R., near Noosa Heads, *G.N.Stevens* 2373 *p.p.* (BRI); S of Dunwich, North Stradbroke Is., *R.W.Rogers* 534 (BRI). N.S.W.: Erina Ck, 3 km E of Gosford, *J.A.Elix* 4709b, 4714 (CANB); Boambie Ck, Sawtell, near Coffs Harbour, *G.N.Stevens* 2042 (BRI).

Pertusaria porinella is characterised by asci with 2 smooth ascospores and by the presence of stictic acid. It is distinguished from other 2-spored, Australian species with stictic acid by the absence of chlorinated xanthenes in the thallus.

***Pertusaria pseudococcodes* Müll.Arg., *Flora* 67: 287 (1884)**

T: Ceylon [Sri Lanka], 1887, ex herb. *Hampe s.n.*; holo: G.

Pertusaria subradians Müll.Arg., *Flora* 67: 463 (1884). T: Ceylon [Sri Lanka], 1876, *G.H.K.Thwaites s.n.*; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 132, fig. 46 (1997).

Thallus pale olive-green, slightly cracked, smooth and dull. Soredia and isidia absent. Apothecia numerous, verruciform, occasionally confluent, flattened-hemispherical, concolorous with the thallus, 0.4–0.6 (–1.0) mm diam. Ostioles conspicuous, black, 1 (–2) per verruca. Ascospores 2 per ascus, ellipsoidal, smooth, (75–) 85–110 (–120) × 30–40 µm, rarely 1 per ascus and 137–150 × 35–45 µm.

Chemistry: Thallus K–, KC–, C–, Pd+ weak yellow; containing stictic acid (major), 4,5-dichlorolichexanthone (minor) and constictic acid (trace).

A rare corticolous species in northern N.T. and north-eastern Qld; also in India, Sri Lanka and Papua New Guinea.

N.T.: below Florence Falls, Litchfield Natl Park, 42 km S of Batchelor, *J.A.Elix* 37711 (CANB). Qld: Black Mtn, 25 km NW of Kuranda, *J.A.Elix* 17535 (CANB).

The lichen is characterised by asci that usually have 2 smooth ascospores and by the presence of 4,5-dichlorolichexanthone and stictic acid. It resembles *P. microstoma*, but it lacks 2-*O*-methylperlatolic acid; the latter also has 4-spored asci.

***Pertusaria pustulata* (Ach.) Duby, *Bot. Gall.* 2(2): 673 (1830)**

Porina pustulata Ach., *Lichenogr. Universalis* 309 (1810). T: France, *Dufour* 86; syn: H-ACH, *n.v.*

Illustration: V.Wirth, *Flechten Baden-Württembergs* 359 (1987).

Thallus off-white to pale dull yellow, occasionally areolate and cracked, smooth. Soredia and isidia absent. Apothecia numerous, conspicuous, crowded and sometimes confluent, flattened-hemispherical, 0.5–0.8 mm diam. Ostiole conspicuous, black, 0.1–0.2 mm diam., 1 per verruca. Ascospores 2 per ascus, ellipsoidal, rarely fabiform, smooth, 87–100 × 30–35 µm.

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

A corticolous species in south-eastern Qld and eastern N.S.W.; a report from W.A. could not be confirmed. Also in Europe, South Africa, North America, Colombia, India, Thailand and Japan.

Qld: Mount Mee S.F., c. 60 km NW of Brisbane, *A.W.Archer* P831 (NSW); 3 km NE of Mt Colliery, *J.Hafellner* 18805 (GZU). N.S.W.: L. Conjola, behind Conjola Beach, 9 km N of Ulladulla, *A.W.Archer* P698 (NSW); Wild Rivers Natl Park, c. 20 km SSE of Armidale, *A.W.Archer* P436 (NSW); Korogoro Ck, Hat Head Natl Park, *A.W.Archer* P636 (NSW).

Pertusaria pustulata is characterised by the bisporous spored asci, conspicuous black ostioles and the presence of stictic acid and 2-chloro-6-*O*-methylnorlichexanthone in the thallus. The rather similar *P. thiospoda* has thiophanic acid as a major compound and paler ostioles.

Pertusaria pycnothelia Nyl., *Bull. Soc. Linn. Normandie*, sér. 2, 2: 70 (1868)

T: Lifu, New Caledonia, 1864, *D.Thiébaud s.n.*; lecto: H-NYL 22960, *fide* J.A.Elix, A.Aptroot & A.W.Archer, *Mycotaxon* 64: 32 (1997).

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 132, fig. 47 (1997).

Thallus pale fawn, thin, smooth and glossy, lacking soredia and isidia. Apothecia numerous, verruciform, scattered, sometimes confluent and forming an almost continuous covering, concolorous with the thallus, flattened-hemispherical, 0.5–0.8 mm diam. Ostiole conspicuous, black-punctiform, in a translucent pale brown zone, 0.3–0.5 mm diam., 1 per verruca. Ascospores 2 per ascus, ellipsoidal to subfusiform, smooth, (95–) 110–137 × 35–40 µm.

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

Corticolous in northern N.T. and north-eastern Qld; also in New Caledonia and Papua New Guinea.

N.T.: Charles Darwin Natl Park, Winnellie, 6 km E of Darwin, *J.A.Elix* 43186, 43197, 43220 (CANB). Qld: Peninsula Development Rd, 56 km NW of Coen, 5 km SE of Archer R. crossing, *H.Streimann* 56326 (CANB); Cooya Beach, *W.H.Ewers* 8499 (CANB).

Pertusaria pycnothelia is characterised by asci with 2 ascospores and the presence of 4,5-dichlorolichexanthone and 2'-*O*-methylperlatolic acid in the thallus. The chemically similar *P. trachyspora* (from Western Australia) has ascospores with rough inner walls.

Pertusaria saltuensis A.W.Archer & Elix, *Mycotaxon* 45: 422 (1992)

T: Old Mill Rd, Lannercost State Forest, 40 km WSW of Ingham, Qld, 18°46'S, 145°48'E, 19 June 1984, *J.A.Elix* 15471; holo: CANB.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 419, fig. 4.

Thallus pale yellowish white to pale yellowish green, thin, discontinuous, cracked, smooth and glossy, lacking soredia and isidia. Apothecia inconspicuous, verruciform, confluent or rarely solitary, concolorous with the thallus, strongly flattened-hemispherical, not constricted at the base, 0.5–0.8 mm diam. Ostiole inconspicuous, black, c. 0.05 mm diam., 1 per verruca. Ascospores 2 per ascus, ellipsoidal, smooth, 105–117 × 35–40 µm.

Chemistry: Thallus K–, KC+ orange, C+ orange, Pd–; containing thiophanic acid (major), 4,5,7-trichloronorlichexanthone (minor), arthothelin (minor), 4,5,7-trichloro-6-*O*-methylnorlichexanthone (trace) and 4,5-dichloronorlichexanthone (trace).

This endemic, corticolous species is known only from the type locality in north-eastern Qld.

Pertusaria saltuensis is characterised by 2-spored asci and the presence of chloronorlichexanthones. It is chemically rather similar to *P. malabara* from Lord Howe Island, but that species contains 6-*O*-methylarthothelin and stictic acid.

Pertusaria subradians Müll.Arg., *Flora* 67: 463 (1884)

T: Ceylon [Sri Lanka], 1876, *G.H.K.Thwaites*; holo: G

Illustration: A.W.Archer & J.A.Elix, *Australas. Lichenol.* 65: 39, fig. 8 (2009).

Thallus greyish green, smooth and glossy, cracked, lacking isidia and soredia. Apothecia verruciform, inconspicuous, scattered, occasionally confluent, markedly flattened-hemispherical, 0.5–1.0 (–1.5) mm diam. Ostiole inconspicuous, pale grey, translucent, 1 per verruca. Ascospores 2 per ascus, elongate-ellipsoidal, hyaline, smooth, 100–115 × 24–30 µm.

Chemistry: containing 4,5-dichlorolichexanthone (minor), 2'-*O*-methylperlatolic acid (major), stictic acid (major), constictic acid (minor) and traces of peristictic, cryptostictic and substictic acids.

A very rare corticolous species in north-eastern Qld; also Sri Lanka.

Qld: Yamanie Section, Girringun Natl Park, 14 km WNW of Abergowrie, in remnant rainforest along Herbert R., *J.A. Elix* 38500 (CANB).

The species is characterised by asci with 2 smooth-walled ascospores, and a distinctive chemistry. It is morphologically similar to *P. pseudococcodes* (q.v.), which also occurs in Sri Lanka, but the ascospores of the latter $82\text{--}105 \times 30\text{--}37 \mu\text{m}$, and it differs chemically in lacking 2'-*O*-methylperlatolic acid. *Pertusaria subradians* is also morphologically similar to *P. pycnothelia* (q.v.), but the ascospores in that species are $95\text{--}137 \times 35\text{--}40 \mu\text{m}$, and it lacks stictic acid.

Pertusaria thiospoda C.Knight, *Trans. Linn. Soc. London, Bot.* 2: 47 (1882)

T: [near Sydney], N.S.W., *C.Knight 20*; holo: WELT.

Pertusaria leiotera Müll.Arg., *Flora* 67: 285 (1884). T: Rockhampton, Qld, *Thozet s.n.*; holo: BRI.

Pertusaria minuta C.Knight, in J.Shirley, *Proc. Roy. Soc. Queensland* 6: 143 (1889). T: Qld, *s. loc.*, *F.M.Bailey s.n.*; holo: WELT.

Pertusaria schizostomella Müll.Arg., *Bull. Herb. Boissier* 3: 637 (1895). T: N.S.W., *s. loc.*, 1887, *C.Knight 31*; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 154, fig. 56 (1997).

Thallus pale yellowish white to pale yellow, thin, slightly cracked, smooth and dull. Soredia and isidia absent. Apothecia inconspicuous, verruciform, scattered, sometimes confluent, flattened-hemispherical, not constricted at the base, 0.5–1.0 mm diam. Ostiole punctiform, black, sometimes surrounded by a pale yellow-brown translucent zone, plane or becoming concave, sometimes with a yellow-brown translucent zone only, 1 per verruca. Ascospores 2 per ascus, ellipsoidal, smooth, $80\text{--}110$ (–120) \times $30\text{--}40 \mu\text{m}$.

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

A predominantly coastal, corticolous species in W.A., N.T., Qld, N.S.W. and Tas.; also in Lord Howe Is., Norfolk Is. and islands off the North Island of New Zealand.

W.A.: East Wallaby Is., Houtmans Abrolhos, *N.Sammy s.n.* (PERTH 921107). N.T.: Bend 7, Tomkinson R., Arnhem Land, *D.Grace s.n.* (MEL 1013779). Qld: 68 km N of Injune, *J.A.Elix 34045* (CANB). N.S.W.: Newport [Newport Beach, 26 km N of Sydney], Oct. 1888, *F.R.M.Wilson* (NSW). Tas.: Hogans Is., Bass Strait, *J.S.Whinray s.n.* (MEL 1013008).

The species is characterised by the 2-spored asci and the presence of thiophanic and stictic acids in the thallus. Specimens of *P. thiospoda* usually show a bright orange fluorescence under long wavelength UV light due to the thiophanic acid.

Pertusaria thwaitesii Müll.Arg., *Flora* 67: 460 (1884)

T: Peradeniya, Ceylon [Sri Lanka], 1876, *G.H.K.Thwaites s.n.*; holo: G.

Pertusaria wilsonii A.W.Archer, *Mycotaxon* 41: 250 (1991). T: Clarke Ra., 46 km S of Proserpine, Qld, *J.A.Elix 20943*; holo: CANB.

Illustration: A.W.Archer, *op. cit.* 243, fig. 11 (1991), as *P. wilsonii*; A.W.Archer, *Fl. Australia* 56A: 106, pl. 53 (2004).

Thallus off-white to pale grey, wrinkled, cracked and areolate, dull. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, concolorous with the thallus, strongly flattened-hemispherical or irregular in outline, 1–2 mm wide. Ostioles numerous, conspicuous, initially pale, becoming black, punctiform and somewhat sunken, 3–8 (–15) per verruca. Ascospores 2 per ascus, elongate-ellipsoidal, rough, $110\text{--}160$ (–175) \times $35\text{--}50 \mu\text{m}$.

Chemistry: Thallus K–, KC–, C–, Pd+ orange-red; containing protocetraric acid (major), virensic acid (trace) and \pm lichexanthone (trace to minor).

A predominantly coastal, corticolous species in Qld, N.S.W. and Vic.; also in Sri Lanka and Papua New Guinea.

Qld: Ravenshoe S.F., 18 km SE of Ravenshoe, *J.A.Elix 16156* (CANB); Killarney, 1890, *F.R.M.Wilson s.n.* (H). N.S.W.: Foxtail Rd, Toonumbar S.F., 26 km NW of Kyogle, *A.W.Archer P434* (NSW); Olney S.F., 25 km W of Morisset, *A.W.Archer P167* (NSW). Vic.: 2 km N of Mallacoota, *A.W.Archer P541* (NSW).

The species is characterised by the off-white thallus with conspicuous, multiostiolate, flattened verrucae, asci with 2 rough-walled ascospores and the presence of protocetraric acid. It resembles *P. hartmannii*, but that species contains norstictic acid and has smooth ascospores.

***Pertusaria trachyspora* A.W.Archer, *Mycotaxon* 41: 247 (1991)**

T: Camp Ck, Mitchell Plateau, W.A., 14°53'S, 125°45'E, 13 June 1976, *R.J.Hnatiuk MP376*; holo: PERTH.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 154, fig. 59 (1997).

Thallus pale olive-green, wrinkled and cracked, dull, lacking soredia and isidia. Apothecia numerous, conspicuous, verruciform, concolorous with the thallus, hemispherical, 0.5–1.0 mm diam. Ostioles black, punctiform, 1–3 per verruca, in a hyaline zone. Ascospores 2 per ascus, ellipsoidal, rough, 95–120 × 30–37 µm.

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

An endemic, corticolous species in north-western W.A.

Pertusaria trachyspora is characterised by asci with 2 rough-walled ascospores and the presence of 4,5-dichlorolichexanthone and 2'-*O*-methylperlatolic acid in the thallus. The chemically similar *P. pycnothelia* has smooth ascospore walls.

***Pertusaria xanthonaria* A.W.Archer & Elix, *Mycotaxon* 49: 148 (1993)**

T: by side of Evans R., c. 3 km SW of Evans Head, N.S.W., 29°06'S, 153°24'E, 12 Sept. 1992, *A.W.Archer P471*; holo: NSW; iso: CANB, MEL.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 145, fig. 3.

Thallus pale yellow, areolate and cracked, smooth and dull, lacking soredia and isidia. Apothecia numerous, verruciform, crowded, rarely confluent, concolorous with the thallus, flattened-hemispherical, 0.6–1.0 mm diam. Ostiole conspicuous, translucent, 1 per verruca, 0.2–0.5 (–0.7) mm diam. Ascospores 2 per ascus, ellipsoidal, smooth, 110–130 × 30–40 µm.

Chemistry: Thallus K–, KC+ weak yellow, C–, Pd–; containing 2,4-dichlorolichexanthone (major), 2,5-dichlorolichexanthone (major), 2,4,5-trichlorolichexanthone (major), 2-chlorolichexanthone (minor) and 4,5-dichlorolichexanthone (trace).

An endemic, corticolous species that is known only from the type locality in eastern N.S.W.

N.S.W.: type locality, *A.W.Archer P391, P392, P462, P463* (NSW).

The lichen is characterised by verrucae with conspicuous translucent ostioles, 2-spored asci and polychlorolichexanthenes in the thallus. It is chemically identical to *P. lordhowensis* (*q.v.*), but that species has 8-spored asci.