

GROUP C

[Thallus corticolous; apothecia verruciform; asci (3–) 4-spored]

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 **P. atromaculata**

Pertusaria aberrans Müll.Arg., *Bull. Herb. Boissier* 1: 42 (1893)

T: Loughton Gully, Lakes Entrance, Vic., Mar. 1889, *F.R.M. Wilson 1517*; holo: G; iso: NSW.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 49, fig. 7 (1997).

Thallus off-white to pale greyish white, coarsely areolate and cracked, smooth and slightly glossy. Soredia and isidia absent. Apothecia numerous, verruciform, contiguous, almost completely covering the thallus, 0.8–1.0 mm diam., immersed or occasionally slightly raised above the surface; centre slightly depressed. Ostioles 1–3 per verruca, black, punctiform, conspicuous, fusing to become 0.1–0.5 mm diam. and slightly sunken and disc-like. Ascospores (3 or) 4 per ascus, uniseriate, ellipsoidal, smooth, 75–87 × 28–36 µm.

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

A rare, endemic, corticolous species in southern Vic.; known only from the type locality.

The species is characterised by 4-spored asci and the presence of thiophanic and stictic acids in the thallus. In this respect it resembles the Japanese species, *P. boninensis* Shibuchi, but the ascospores of the latter are larger (100–130 × 30–45 µm).

Pertusaria alboaspera A.W.Archer & Elix, *Mycotaxon* 49: 143 (1993)

Thallus pale yellowish white, thin, areolate and cracked, smooth and dull. Soredia and isidia absent. Apothecia numerous, verruciform, concolorous with the thallus, sometimes confluent, hemispherical to flattened-hemispherical, not constricted at the base, 0.5–1.0 mm diam. Ostiole inconspicuous, pale, translucent, 1 per verruca. Ascospores 8 per ascus, biseriata, ellipsoidal, smooth, 90–100 × 30–37 µm.

The species is characterised by 4 or 8 biseriata ascospores in each ascus and by its chemistry. *Pertusaria verruculifera* Vain. has ±identical chemistry, but the asci contain 8 smaller, uniseriate ascospores.

- Ascospores 4 per ascus **b. var. tetraspora**
- Ascospores 8 per ascus **a. var. alboaspera**

a. Pertusaria alboaspera A.W.Archer & Elix var. **alboaspera**

T: Sawpit Ck, Border Ranges Natl Park, c. 30 km NNW of Kyogle, N.S.W., 28°22'S, 152°50'E, 30 Aug. 1992, *A.W.Archer P422*; holo: NSW.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 145, fig. 1.

Ascospores 8 per ascus.

Chemistry: Thallus K–, KC–, C–, Pd–, UV+ yellow; containing lichexanthone (major), 2,2'-di-*O*-methylstenosporic acid (major), stictic acid (major) and constictic acid (minor).

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

Pertusaria verruculifera Vain. has identical chemistry, but the asci contain smaller, uniseriate ascospores.

b. *Pertusaria alboaspera* var. *tetraspora* Jariangprasert, *Mycotaxon* 91: 280 (2005)

T: near Pha Chang Phan Cliff, Phu Luang Wildlife Sanctuary, Loei Province, Thailand, in oak-dipterocarp forest, alt. 1510 m, 3 Feb. 2002, *S.Jariangprasert* 2248; holo: QBG.

Illustration: A.W.Archer & J.A.Elix, *Australas. Lichenol.* 67: 21, figs 9, 10 (2010).

Thallus corticolous, off-white to pale fawn, subtuberculate and slightly glossy, lacking isidia and soredia. Apothecia numerous, scattered, conspicuous, verruciform, flattened-hemispherical, rarely confluent, 0.6–1.5 mm diam; ostioles hyaline, inconspicuous, 1–2 per verruca. Ascospores 4 per ascus, hyaline, smooth-walled, ellipsoidal, $80\text{--}85 \times 30\text{--}35 \mu\text{m}$.

Chemistry: containing lichexanthone (major or minor), 2,2'-di-*O*-methylstenosporic acid (major), stictic acid (major), constictic acid (minor), planaic acid (trace), methyl 2,2'-di-*O*-methylstenosporate (trace).

A very rare corticolous species in northern N.S.W.; also in montane areas of northern and north-eastern Thailand.

N.S.W.: Mount Warning Natl Park, by side of track near foot of mountain, *A.W. Archer P514* (NSW).

Pertusaria aquilonia A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 46 (1997)

T: Portland Roads, 14 km SW of Cape Weymouth, Qld, $12^{\circ}42'S$, $143^{\circ}20'E$, 18 Oct. 1995, *H.Streimann* 56605A; holo: CANB.

Illustration: A.W.Archer, *op. cit.* 49, fig. 8.

Thallus off-white, thin, smooth and glossy. Soredia and isidia absent. Apothecia inconspicuous on the rough substratum, verruciform, scattered, flattened-hemispherical, somewhat distorted, concave above, 0.8–1.2 mm diam.; ostioles inconspicuous, black-punctiform in a grey translucent zone, 1 per verruca. Ascospores 3 (or 4) per ascus, ellipsoidal, smooth, $70\text{--}80 \times 25\text{--}35 \mu\text{m}$.

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

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

Qld: type locality, *H.Streimann* 56606 (CANB).

Pertusaria aquilonia is characterised by asci with 3 (or 4) ascospores and the presence of chlorolichexanthenes and 2-*O*-methylperlatolic acid in the thallus. While it resembles *P. ceylonica*, *P. aquilonia* contains perlatolic acid derivatives in place of the stictic acid present in *P. ceylonica*.

Pertusaria atromaculata A.W.Archer & Elix, *Mycotaxon* 45: 418 (1992)

T: Noosa R., c. 60 km SE of Gympie, Qld, $26^{\circ}23'S$, $153^{\circ}02'E$, 27 July 1986, *J.Hafellner* 19664; holo: GZU.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 419, fig. 2 (1992).

Thallus off-white to pale greyish white, coarsely areolate and cracked, smooth and dull. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, sometimes confluent, concolorous with the thallus, subhemispherical, becoming flattened-hemispherical, often constricted at the base, 0.7–1.0 mm diam.; ostioles conspicuous, black, punctiform, 1–3 per verruca, 0.05–0.10 mm diam., set in a pale grey sometimes concave translucent zone 0.3–0.5 mm diam. Ascospores 4 per ascus, uniseriate, ellipsoidal, smooth, $85\text{--}120 \times 35\text{--}47 \mu\text{m}$.

Chemistry: Thallus K⁻, KC⁻, C⁻, Pd⁻; containing lichexanthone (major), 2-chlorolichexanthone (major), stictic acid (major) and constictic acid (trace).

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

Pertusaria atromaculata is characterised by 4-spored asci and the distinctive thallus chemistry. It is morphologically similar to *P. dehiscens*, but it can be separated from that species by the number of ascospores per ascus (8 in *P. dehiscens*) and the presence of 2-chlorolichexanthone as a major compound.

***Pertusaria ceylonica* Müll.Arg., *Flora* 67: 351 (1884)**

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

Thallus pale greenish grey, slightly areolate and cracked, smooth and glossy. Soredia and isidia absent. Apothecia numerous, verruciform, scattered or sometimes confluent, concolorous with the thallus, flattened-hemispherical, 0.4–0.6 mm diam. Ostioles black, punctiform, 1 (or 2) per verruca. Ascospores 3 (or 4) per ascus, uniseriate, ellipsoidal, smooth, (75–) 95–125 (–135) × 30–45 (–50) µm.

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

A tropical to subtropical corticolous species in northern N.T. and north-eastern Qld. Also in Sri Lanka, Indonesia and Papua New Guinea.

N.T.: Kapalga, Kakadu Natl Park, *M.Day* (CANB); Baroalba Ck, 19 km S of Jabiru, Kakadu Natl Park, *J.A.Elix 22574* (CANB); 19 km S of Jabiru, *J.A.Elix 22574* (CANB). Qld: Machans Beach, N of Cairns, *H.Mayrhofer 11419* (GZU); 27 km NE of Coen, McIlwraith Ra., *H.Streimann 56814* (CANB).

Pertusaria ceylonica is characterised by the predominantly 3-spored asci and the presence of 2,5-dichlorolichexanthone and stictic acid in the thallus. It is chemically similar to *P. cicatricosa* and *P. pertusella*, but the smooth inner ascospore wall and the mainly 3-spored asci are distinctive.

***Pertusaria depressa* (Fée) Mont. & Bosch, in F.A.W.Miquel, *Pl. Junghuhn*. 4: 482 (1855)**

Porina depressa Fée, *Essai Crypt. Écorc. Officin.* 80 (1824); *Pertusaria depressa* (Fée) Müll.Arg., *Flora* 67: 288 (1884), *nom. superfl.* T: tropical America, ad *Cinchonarium cortices*, *n.v.*

[*Pertusaria modesta* auct. non Müll.Arg.: A.W.Archer, *Biblioth. Lichenol.* 69: 108 (1997)]

Illustrations: A.W.Archer & J.A.Elix, *Australas. Lichenol.* 67: 22, figs 11, 12 (2010).

Thallus pale fawn, glossy and cracked, lacking isidia and soralia. Apothecia verruciform, conspicuous, concolorous with the thallus, hemispherical, scattered, occasionally confluent, 0.7–1.0 mm diam. Ostioles black, conspicuous, 2–4 per verruca, 0.05–0.10 mm diam. Ascospores 3–4 per ascus, hyaline, smooth, ellipsoidal, 100–120 × 40–50 µm.

Chemistry: containing 2-chlorolichexanthone (major or minor), lichexanthone (minor), 2-*O*-methylhyperlatolic acid (major or minor), 2-*O*-methylsuperlatolic acid (major), ± 2-*O*-methylperlatolic acid (minor), ± methylplanaiate (minor), ± stenosporic acid (trace), perlatolic acid (trace).

A rare corticolous species in northern N.T. and northern N.S.W.; also in Venezuela, Brazil, Cuba, Indonesia and Papua New Guinea.

N.T.: Channell Pt, 23 km NNW of Daly R., *J.A.Elix 27696* (CANB). N.S.W.: Toonumbar S.F., c. 26 km WNW of Kyogle, *A.W.Archer P438* (NSW).

Pertusaria depressa is characterised by verrucae with conspicuous black ostioles, asci with 3–4 smooth-walled ascospores and by the presence of 2-chlorolichexanthone and higher homologues of the more common 2-*O*-methylperlatolic acid.

This species was previously reported from Australia as *P. modesta* Müll.Arg. (Archer, 1997).

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), \pm stictic acid (major), 2-chlorolichexanthone (minor), 2'-O-methylperlatolic acid (minor), 2-O-methylperlatolic acid (minor), 2,4-dichlorolichexanthone (trace), \pm 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 μ m long a. var. **elliptica**
Asci with 2 ascospores; ascospores (130–) 140–175 (–190) μ m 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 \times 30–45 μ m.

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) \times 40–50 μ m.

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 ewersii A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 65 (1997)

T: Davies Creek Natl Park, Qld, 16°58'S, 145°33'E, 30 Sept. 1991, *W.H.Ewers 8651*; holo: CANB.

Illustration: A.W.Archer, *op. cit.* 61, fig. 16.

Thallus thin, pale fawn, cracked, smooth and dull. Soredia and isidia absent. Apothecia verruciform, scattered, rarely confluent, concolorous with the thallus, flattened-hemispherical, 0.5–0.8 mm diam. Ostioles conspicuous, black, 1 per verruca. Ascospores (3 or) 4 per ascus, ellipsoidal, smooth, 64–75 \times 25–32 μ m.

Chemistry: Thallus K⁻, KC⁻, C⁻, Pd⁻; containing 2,4,5-trichlorolichexanthone (major), 2,5-dichlorolichexanthone (major), 2-chlorolichexanthone (major), stictic acid (major), confluent acid (minor), constictic acid (minor), 2'-*O*-methylmicrophyllinic acid (trace) and microphyllinic acid (trace).

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

Pertusaria ewersii is characterised by asci with 4 (rarely 3) ascospores and the presence of polychlorolichexanones, confluent acid and stictic acid in the thallus. It resembles *P. ceylonica* (*q.v.*), but that species has larger ascospores (95–125 µm long) and lacks thalline depsides.

Pertusaria follmanniana A.W.Archer & Elix, in J.A.Elix, C.E.Barclay & A.W.Archer, *Flechten Follmann* 22 (1995)

T: beside Sawpit Ck, Border Ranges Natl Park, c. 30 km NNW of Kyogle, N.S.W., 28°22'S, 152°50'E, 30 Aug. 1992, A.W.Archer P426; holo: CANB; iso: NSW.

Illustration: J.A.Elix, C.E.Barclay & A.W.Archer, *op. cit.* 23, fig. 2.

Thallus off-white to pale fawn, smooth and slightly glossy. Soredia and isidia absent. Apothecia numerous, crowded and often confluent, verruciform, concolorous with the thallus, flattened-hemispherical, 0.7–1.0 mm diam. Ostioles black, conspicuous, 0.05–0.10 mm diam., 1 per verruca. Ascospores 4 per ascus, ellipsoidal to subfusiform, smooth, 105–125 × 35–45 µm.

Chemistry: Thallus K⁻, KC⁻, C⁻, Pd⁻; containing 2-chlorolichexanthone (major), stictic acid (minor), 2-*O*-methylisohyperlatolic acid (minor), 2-*O*-methylsuperlatolic acid (minor), constictic acid (trace), 2-*O*-methylhyperlatolic acid (trace) and 2-*O*-methylperlatolic acid (trace).

This endemic corticolous species is known from the type locality in north-eastern N.S.W. and one site in north-eastern Qld.

Qld: Kareeya Power Station, Tully Gorge, 49 km NW of Tully, *J.A.Elix* 37425 (CANB).

The species is characterised by crowded verrucae with conspicuous, black ostioles, 4-spored asci and the presence of higher homologues of 2-*O*-methylperlatolic acid.

Pertusaria glomelliferica Elix & A.W.Archer, in J.A.Elix, S.Jariangprasert & A.W.Archer, *Telopea* 12: 268 (2008)

T: Burma Rd, 29 km SE of junction with Walkaway–Nangetty road, W.A., 29°04'07"S, 115°09'26"E, alt. 240 m, 4 May 2004, *J.A.Elix* 33773; holo: PERTH.

Illustration: J.A.Elix, S.Jariangprasert & A.W.Archer, *op. cit.* 267, fig. 6 (2008).

Thallus pale to medium yellow, smooth and dull, lacking isidia and soredia. Apothecia verruciform, concolorous with the thallus, conspicuous, numerous, scattered or crowded, occasionally confluent, hemispherical to flattened-hemispherical, not constricted at the base, 0.50–0.75 (–1.0) mm diam. Ostioles black, punctiform, 0.1–0.2 mm diam., 1 (–4) per verruca, sometimes in a pale yellow translucent zone. Asci amyloid with a distinctive ocular chamber; hymenium non-amyloid. Ascospores elongate-ellipsoidal, hyaline, smooth, (2) 3 per ascus, 80–105 (–120) × (25–) 30–36 (–40) µm.

Chemistry: containing thiophanic acid (major), glomelliferic acid (major or minor), 2-chloro-6-*O*-methylnorlichexanthone (minor), 4-chloro-6-*O*-methylnorlichexanthone (minor), ± 4-*O*-demethylglomelliferic acid, ± glomellic acid (minor).

An uncommon corticolous species in W.A. and S.A.

W.A.: nature reserve, Coolimba–Eneabba road, 20 km by road W of Eneabba, *J.A.Elix* 28904 (CANB); Ellendale Pool, 23 km W of Walkaway, *J.A. Elix* 33761 (CANB); Wabeling, Moora–New Norcia road, Quarrell Ra., *J.A.Elix* 37563B (CANB); Kalbarri Natl Park, 24 km NW of Kalbarri township, *J.A.Elix* 33650 (CANB). S.A.: Ferries–McDonald Conservation Park, 10 km S of Monarto, *J.A.Elix* 39370 (CANB).

Pertusaria glomelliferica is characterised by the yellow thallus and ostioles, asci with 2 or 3 ascospores and the presence of glomelliferic acid. This compound has previously been found

in only one species of *Pertusaria*, viz. *P. corrugata* Kremp. from Brazil. Glomelliferic acid is closely related to perlatolic acid, derivatives of which are common in the genus.

***Pertusaria hermaka* A.W.Archer, *Mycotaxon* 41: 227 (1991)**

T: 3 km S of Forest Beach, 16 km S of Ingham, Qld, 22 June 1984, *J.A.Elix* 15939; holo: CANB.

Illustration: A.W.Archer, *op. cit.* 229, fig. 4.

Thallus pale greyish green, wrinkled and folded, cracked and dull. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, hemispherical, becoming constricted at the base, sometimes confluent, 0.7–1.5 mm diam. Ostioles inconspicuous, hyaline, rarely dark, plane or somewhat papilliform, 1–4 per verruca. Ascospores 4 per ascus, elongate-ellipsoidal, smooth, 90–125 (–150) × 25–40 μm.

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

This corticolous species is known from northern N.T., eastern Qld and north-eastern N.S.W.; also in Papua New Guinea.

N.T.: Charles Darwin Natl Park, Winnellie, 6 km E of Darwin, *J.A.Elix* 36850, 36856, 36857 (CANB). Qld: McIlwraith Ra., 27 km NE of Coen, *H.Streimann* 56769A (CANB); Black Mtn, 25 km NW of Kuranda, *J.A.Elix* 17542 (CANB); Proserpine R. valley, 20 km WNW of Proserpine, *J.A.Elix* 21100 (CANB); Coochiemudlo Is., Moreton Bay, *J.A.Elix* 10445 (CANB). N.S.W.: Sawpit Ck, Border Ranges Natl Park, 30 km NNW of Kyogle, *A.W.Archer* P424 (NSW).

Pertusaria hermaka is characterised by having 4-spored asci and its thalline chemistry. It is chemically similar to *P. microstoma*, but the ascospores of that species have rough inner walls.

***Pertusaria leucophaea* Elix & A.W.Archer, *Australas. Lichenol.* 67: 15 (2010)**

T: opposite the Oakey Golf Club, Jondaryan–Mount Tyson road, Qld, 27°23'05"S, 151°36'44"E, alt. 390 m, on *Pittosporum*, 5 May 2005, *J.A.Elix* 39777; holo: BRI; iso: CANB.

Illustration: J.A.Elix & A.W.Archer, *op. cit.* 19, figs 3, 4.

Thallus off-white to ash-grey, dull and conspicuously cracked, lacking soredia and isidia. Apothecia verruciform, conspicuous, scattered, flattened-hemispherical, 0.7–1.2 mm diam. Ostiole pale, initially flat, becoming mammiform, 1 per verruca. Ascospores 4 per ascus, ellipsoidal, hyaline, rough-walled, 80–110 × 30–34 μm.

Chemistry: containing 4,5-dichlorolichexanthone (major).

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

Pertusaria leucophaea is characterised by the verruciform apothecia with mammiform ostioles, asci with 4 rough-walled ascospores and the presence of 4,5-dichlorolichexanthone as the only lichen substance. The tropical *P. microstoma* Müll.Arg. has ascospores similar to those of *P. leucophaea*, but is has an olive-green thallus, conspicuous black ostioles and 2'-*O*-methylperlatolic and stictic acids in addition to 4,5-dichlorolichexanthone.

***Pertusaria leucothelia* Müll.Arg., *Bull. Herb. Boissier* 3: 637 (1895)**

T: Vic., *s. loc.*, 1887, *C.Knight* 174; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 92, fig. 29 (1997).

Thallus pale greyish green, cracked, dull and smooth. Soredia and isidia absent. Apothecia inconspicuous, verruciform, sparse, scattered, irregularly hemispherical, 0.5–1.0 (–1.5) mm diam. Ostioles inconspicuous, pale, 1 or 2 per verruca. Ascospores 4 per ascus, ellipsoidal, rough, (75–) 87–97 × (30–) 35–42 μm.

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

An uncommon, endemic, corticolous species in N.S.W., A.C.T. and Vic.

N.S.W.: Oyster Shell Rd, 9 km N of Spencer, *A.W.Archer P341* (NSW); Warrumbungles Natl Park, 25 km W of Coonabarabran, *W.H.Ewers 3667* (CANB). A.C.T.: S of Paddys R., near Murrays Corner, *J.A.Elix 655* (CANB). Vic.: Curran Ck, Nelson, 35 km SE of Mt Gambier, *W.H.Ewers 6236* (CANB); Trawool, Tallarook Ra., Sept. 1885, *F.R.M.Wilson* (NSW).

The species is characterised by asci with 4 rough ascospores and the presence of planaic acid in the thallus. It is chemically similar to *P. planaica*, but that lichen has 8-spored asci.

Pertusaria malmei Elix & A.W.Archer, in A.W.Archer & J.A.Elix, *Australas. Lichenol.* 65: 34 (2009)

Pertusaria quassiae (Fée) Nyl. var. *sordida* Malme, *Ark. Bot.* 28A: 13 (1936). T: Cuyabá, Matto Grosso, Brazil, 7 Dec. 1895, *G.O.A.Malme 2086*; holo: S.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 39, fig. 7.

Thallus off-white to greyish green, smooth and dull, cracked, lacking isidia and soredia. Apothecia verruciform, numerous, rarely confluent, flattened-subspherical to flattened-hemispherical, 0.5–1.0 mm diam. Ostiole inconspicuous, pale grey, translucent, 1 per verruca. Ascospores 4 per ascus, elongate-ellipsoidal, hyaline, smooth-walled, 80–94 × 25–36 µm.

Chemistry: Thallus containing 4,5-dichlorolichexanthone (major), 4-chlorolichexanthone (trace) and 2-*O*-methylperlatolic acid (major).

A rare corticolous species in central-western N.S.W.; also in Brazil.

N.S.W.: Cookamidgera S.F., 3.5 km SSW of Cookamidgera, *J.A.Elix 39075* (CANB).

Pertusaria malmei is characterised by the verruciform apothecia, asci with 4 ascospores and the presence of 4,5-dichlorolichexanthone and 2-*O*-methylperlatolic acid. It is chemically and morphologically similar to *P. doradorensis* (*q.v.*), but the latter has longer ascospores [(82–) 95–125 µm], and it contains additional planaic acid.

Pertusaria microstoma Müll.Arg., *Flora* 65: 328 (1882)

T: Indonesia, *s. loc.*, 1882, *hb. Lugd. Bat.* (sic); holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 106, fig. 34 (1997).

Thallus olive-green, areolate and cracked, dull, tuberculate due to confluent verrucae. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, crowded, often confluent; individual verrucae 0.4–0.7 mm diam., flattened-hemispherical, occasionally constricted at the base; confluent verrucae 1.0–1.5 mm diam. Ostioles conspicuous, black, 0.05–0.10 mm diam., sometimes in a hyaline zone. Ascospores usually 4 per ascus, ellipsoidal, rough, 82–105 (–135) × 35–45 µm.

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

Occurs on bark in north-eastern Qld; also in Indonesia, Papua New Guinea and New Caledonia.

Qld: Black Mtn, 25 km NW of Kuranda, *J.A.Elix 17540* (CANB); Mt Fox, 43 km SW of Ingham, *H.Streimann 37012* (CANB); Lake Barrine Natl Park, *J.A.Elix 2611* (CANB).

Pertusaria microstoma is characterised by asci with 4 rough-walled ascospores and by the chemistry of the thallus. On rare occasions, an ascus can contain 1 ascospore of c. 250 × 45 µm. This species is distinguished from the morphologically similar *P. elliptica* by the presence of stictic acid and 4,5-dichlorolichexanthone.

Pertusaria nebulosa A.W.Archer, in J.A.Elix, H.Streimann & A.W.Archer, *Proc. Linn. Soc. New South Wales* 113: 65 (1992)

T: Duncombe Bay, Norfolk Island, 29°00'20"S, 167°57'30"E, alt. 100 m, on *Elaeodendron* in regrowth forest just S of the Captain Cook Memorial, 3 Dec. 1984, *J.A.Elix 18389*; holo: CANB.

Illustration: J.A.Elix, H.Streimann & A.W.Archer, *op. cit.* 66, fig. 2B.

Thallus pale olive-green, slightly tuberculate, smooth and glossy, lacking isidia and soredia. Apothecia verruciform, conspicuous, numerous, rarely confluent, flattened-hemispherical, becoming constricted at the base, 0.8–1.5 (–2.0) mm diam. Ostioles conspicuous, black, lacking a hyaline margin, 1–4 per verruc. Ascospores 4 per ascus, uniseriate, ellipsoidal, smooth, 95–115 × 30–35 µm.

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

This corticolous endemic species is known only from the type locality in Norfolk Island.

Pertusaria nebulosa is characterised by 4-spored asci, conspicuous ostioles and the absence of lichen compounds.

Pertusaria pallida A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 117 (1997)

T: Tully Falls Rd, 8 km SE of Ravenshoe, Qld, 17°40'S, 145°31'E, on bark, 29 June 1984, *H.Streimann 30169*; holo: CANB.

Illustration: A.W.Archer, *op. cit.* 123, fig. 38 (1997).

Thallus off-white, thin, cracked, smooth, glossy, lacking soredia and isidia. Apothecia numerous, verruciform, often confluent, flattened-hemispherical, concolorous with the thallus, occasionally concave above, 1.0–1.5 mm diam. Ostiole inconspicuous, pale, translucent, 1 per verruca. Ascospores (3–) 4 (–5) per ascus, uniseriate, ellipsoidal to subfusiform, rough-walled, (105–) 115–125 (–140) × 40–50 µm.

Chemistry: Thallus K–, KC–, C–, Pd–; containing 2'-*O*-methylperlatolic acid (major), stictic acid (major), 2-chlorolichexanthone (minor), planaic acid (minor), 2-*O*-methylperlatolic acid (minor), methyl planiate (?minor), constictic acid (minor) and cryptostictic acid (trace).

An rare, endemic, corticolous species in north-eastern Qld and northern N.S.W.

N.S.W.: Coramba road, c. 15 km ENE of Dorrigo, *A.W.Archer P973, P974* (NSW).

Pertusaria pallida is characterised by asci that are usually 4-spored and the presence of 2-chlorolichexanthone, 2'-*O*-methylperlatolic acid and stictic acid in the thallus.

Pertusaria paradoxica A.W.Archer & Elix, *Mycotaxon* 45: 420 (1992)

T: slopes of Black Mtn, 25 km NW of Kuranda, Qld, 16°40'S, 145°29'E, 7 July 1984, *J.A.Elix 17541*; holo: CANB.

Illustrations: A.W.Archer & J.A.Elix, *op. cit.* 419, fig. 3 (1992); A.W.Archer, *Biblioth. Lichenol.* 69: 123, fig. 39 (1997).

Thallus greenish yellow to pale greenish grey, wrinkled and cracked, smooth and dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, occasionally confluent, concolorous with the thallus, flattened-hemispherical, becoming constricted at the base, sometimes slightly concave above, 0.8–1.4 mm diam. Ostioles inconspicuous, pale to dark brown, in a subhyaline zone, 1–4 per verruca. Ascospores 4 or 8 per ascus, irregularly uniseriate, ellipsoidal to subfusiform, smooth, 75–145 × 30–45 µm.

Chemistry: Thallus K–, KC+ violet, C+ violet, Pd–; containing 4-*O*-methylisocryptochlorophaeic acid (major), stictic acid (major), thiophanic acid (minor) and constictic acid (minor).

The *meta*-depside 4-*O*-methylisocryptochlorophaeic acid is the only 5'-hydroxy-substituted *meta*-depside found so far in lichens.

Two varieties of this corticolous species are recognised.

Ascospores 4 per ascus, 95–125 (–145) μm long..... **b. var. tetraspora**
Ascospores 8 per ascus, 75–100 μm long..... **a. var. paradoxica**

a. *Pertusaria paradoxica* A.W.Archer & Elix var. *paradoxica*

Ascospores 8 per ascus, 75–100 μm long.

An uncommon, endemic variety in rainforest in eastern Qld and N.S.W.

Qld: Conway S.F., 18 km E of Proserpine, *J.A.Elix 20223* (CANB); Noosa R., c. 70 km SE of Gympie, *J.Hafellner 19630* (GZU). N.S.W.: Evans R., c. 3 km S of Evans Head, *A.W.Archer P390* (DUKE, NSW); 1 km S of Springwood, Blue Mountains Natl Park, *A.W.Archer P221, P223* (NSW); Glenbrook Ck, Blue Mountains Natl Park, *K.Kalb 18870* (Herb. K.Kalb).

b. *Pertusaria paradoxica* var. *tetraspora* A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 119 (1997)

T: by side of Wilson R., Mount Boss State Forest, 37 km NW of Wauchope, N.S.W., 32°33'S, 151°29'E, alt. c. 250 m, 14 Oct. 1993, *A.W.Archer P662*; holo: NSW.

Ascospores 4 per ascus, 95–125 (–145) μm long.

This variety is sympatric with var. *paradoxica* in eastern N.S.W.

N.S.W.: Towlers Bay, c. 30 km N of Sydney, *A.W.Archer P818* (NSW).

The variety is chemically and morphologically almost identical to var. *paradoxica*, and the two varieties are differentiated only by the length of their ascospores and the number of ascospores in the asci.

***Pertusaria subcerussata* A.W.Archer, *Mycotaxon* 44: 16 (1992)**

T: Albert R. valley, S of Beaudesert, Qld, 28°10'S, 153°02'E, 1 Sept. 1986, *J.Hafellner 18464*; holo: GZU.

Illustration: A.W.Archer, *op. cit.* 15, fig. 3.

Thallus off-white to pale greyish white, thin, cracked, smooth and glossy, lacking soredia and isidia. Apothecia verruciform, hemispherical or flattened-hemispherical, concolorous with the thallus, 0.8–1.4 mm diam. Ostioles inconspicuous, translucent, projecting from the verrucae, c. 0.2 mm diam., 1 or 2 per verruca. Ascospores 4 per ascus, uniseriate, ellipsoidal, rough-walled, 90–95 \times 35–50 μm .

Chemistry: Thallus K–, KC–, C–, Pd–; containing lichexanthone.

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

Pertusaria subcerussata is characterised by asci with 4 rough-walled ascospores and the presence of lichexanthone. It resembles *P. anisotropa* Müll.Arg., from Brazil, but that species has ascospores 125–200 μm long, and it contains unidentified fatty acids.

***Pertusaria subsidiosa* A.W.Archer, *Mycotaxon* 41: 242 (1991)**

T: North Stradbroke Is., Qld, 27°29'S, 153°26'E, 10 Aug. 1986, *J.Hafellner 19204*; holo: GZU.

Illustration: A.W.Archer, *op. cit.* 243, fig. 8.

Thallus pale cream-white, thin, continuous, smooth and dull. Soredia absent. Isidia simple, concolorous with the thallus, profuse, 0.1–0.3 mm tall, 0.05–0.10 mm wide. Apothecia inconspicuous, verruciform, isidiate, concolorous with the thallus, scattered, flattened-hemispherical, not constricted at the base, 0.5–0.7 mm diam. Ostiole conspicuous, black, 0.1–0.2 mm diam., 1 per verruca. Ascospores 4 per ascus, uniseriate, ellipsoidal, rough, 80–95 \times 30–35 μm .

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

An uncommon, coastal, corticolous species in eastern Qld and N.S.W.; also in New Zealand.

Qld: Pine Mtn, 24 km NE of Rockhampton, *J.A.Elix 34700* (CANB). N.S.W.: Temagog, 22 km N of Kempsey, *J.A.Elix 33167* (CANB); Kattang Nature Reserve, 5 km E of Laurieton, *A.W.Archer P608* (NSW); Yuragir Natl Park, 40 km ESE of Grafton, *A.W.Archer P382* (NSW).

This species is characterised by the isidiate thallus and ascomatal verrucae, asci with 4 rough-walled ascospores and the distinctive chemistry. It resembles *P. isidiosa*, but that species has 2-spored asci and it contains lichexanthone.

***Pertusaria tjaetabensis* A.W.Archer & Elix, *Australas. Lichenol.* 65: 33 (2009)**

T: Greenant Creek, trail to Tjaetaba Falls, Litchfield Natl Park, 60 km SW of Batchelor, N.T., 13°12'04"S, 130°42'03"E, alt. 60 m, on dead wood in monsoon vine forest, 5 August 2005, *J.A.Elix 38407*; holo: CANB.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 38, fig. 6.

Thallus off-white to pale olive-green, thin, subtuberculate and glossy, cracked, lacking isidia and soredia. Apothecia verruciform, scattered, rarely confluent, flattened-hemispherical, 0.3–1.2 mm diam. Ostioles inconspicuous, black, 1 (–2) per verruca. Ascospores ellipsoidal, hyaline, smooth, (2–) 3 (–4) per ascus, 70–88 (–100) × 26–34 µm.

Chemistry: containing 2,4,5-trichlorolichexanthone (minor), 2,5-dichlorolichexanthone (minor), 2,4-dichlorolichexanthone (trace), 2-*O*-methylperlatolic acid (major), 2-*O*-methylhyperlatolic acid (minor), planaic acid (minor), methyl planaiate (minor), stictic acid (major), constictic acid (minor), cryptostictic acid (trace) and peristictic acid (trace).

A rare corticolous species in northern N.T.

The species is characterised by asci with predominantly 3 ascospores, and the presence of 2,4,5-trichlorolichexanthone, 2-*O*-methylperlatolic and stictic acids as major compounds.