

## GROUP B

### [Thallus corticolous; apothecia verruciform; asci 8-spored]

1	Ascospores usually uniseriate in the asci .....	2
1:	Ascospores usually biseriata in the asci .....	26
2	Thallus K+ yellow then red, containing norstictic acid .....	3
2:	Thallus K-, not containing norstictic acid .....	4
3	Ascospores globose, 17–20 µm diam .....	<b>P. globospora</b>
3:	Ascospores ellipsoidal, 60–95 µm long .....	<b>P. endoxantha</b>
4	Thallus KC+ yellow, orange or violet, containing thiophaninic acid .....	5
4:	Thallus K-, not containing thiophaninic acid .....	8
5	Verrucae C+ violet, containing 4- <i>O</i> -methylisocryptochlorophaeic and stictic acids .....	<b>P. paradoxa</b> var. <b>paradoxa</b>
5:	Verrucae C- .....	6
6	Thallus containing stictic acid .....	<b>P. leioplacella</b>
6:	Thallus not containing stictic acid .....	7
7	Thallus containing 2- <i>O</i> -methylperlatolic acid, but not perlatolic acid; ascospores 30–42 µm wide .....	<b>P. xylophytes</b>
7:	Thallus containing perlatolic acid, but not 2- <i>O</i> -methylperlatolic acid; ascospores 22–30 µm wide .....	<b>P. injuneana</b>
8	Thallus UV+ yellow; lichexanthone present .....	9
8:	Thallus UV-; lichexanthone absent .....	10
9	Thallus containing 2- <i>O</i> -methylperlatolic acid; ascospores 75–105 µm long .....	<b>P. leucostigma</b>
9:	Thallus containing 2,2-di- <i>O</i> -methylstenosporic and stictic acids (but only traces of 2- <i>O</i> -methylperlatolic acid); ascospores 50–67 µm long .....	<b>P. verruculifera</b>
10	Thallus not containing chlorolichexanthenes .....	11
10:	Thallus containing chlorolichexanthenes .....	13
11	Thallus containing 2- <i>O</i> -methylperlatolic acid .....	<b>P. mattogrossensis</b>
11:	Lichen compounds absent .....	12
12	Ascospores 50–74 µm long .....	<b>P. albissima</b>
12:	Ascospores 70–110 µm long .....	<b>P. subrigida</b>
13	Thallus containing 2-chlorolichexanthone .....	14
13:	Thallus containing di- and/or trichlorolichexanthenes .....	15
14	Thallus containing 2'- <i>O</i> -methylstenosporic acid; ascospores 60–70 µm long .....	<b>P. boweniana</b>
14:	Thallus containing divaricatic acid; ascospores 70–92 µm long .....	<b>P. orarensis</b>
15	Both di- and trichlorolichexanthenes present .....	16
15:	Only 4,5-dichlorolichexanthone present; trichlorolichexanthenes absent .....	18
16	Thallus containing stictic acid .....	<b>P. gundermanica</b>
16:	Thallus not containing stictic acid .....	17
17	Thallus containing planaic acid (with no more than traces of methylperlatolic acid); spores 40–65 µm long .....	<b>P. subarida</b>
17:	Thallus containing 2- <i>O</i> -methylperlatolic and 2'- <i>O</i> -methylperlatolic acids, not planaic acid; ascospores 45–50 µm long .....	<b>P. complanata</b>
18	Ascospores 32–70 µm long .....	19
18:	Ascospores > 70 µm long .....	22

19	Stictic acid present; ostioles conspicuous, white.....	<b>P. leucostomoides</b>
19:	Stictic acid absent .....	20
20	Thallus containing 2'- <i>O</i> -methylperlatolic acid; ascospores 32–70 µm long .....	<b>P. pertractata</b>
20:	Thallus containing 2- <i>O</i> -Methylperlatolic acid.....	21
21	Thallus containing 2- <i>O</i> -methylperlatolic and methyl 2- <i>O</i> -methylperlatolate acids; ascospores 50–60 µm long .....	<b>P. xenismota</b>
21:	Thallus containing 2- <i>O</i> -methylperlatolic acid; ascospores 36–46 µm long.....	<b>P. minispora</b>
22	Thallus containing 2'- <i>O</i> -methylstenosporic acid .....	<b>P. praetermissa</b>
22:	Thallus not containing 2'- <i>O</i> -methylstenosporic acid .....	23
23	Ostioles usually protruding .....	24
23:	Ostioles usually not protruding .....	25
24	Thallus containing 2'- <i>O</i> -methylperlatolic acid, but not miriquidic acid.....	<b>P. mesotropia</b>
24:	Thallus containing miriquidic acid, not 2'- <i>O</i> -methylperlatolic acid .....	<b>P. novaehollandiae</b>
25	Thallus containing planaic acid, but not 2,2'-di- <i>O</i> -methylstenosporic acid .....	<b>P. planaica</b>
25:	Thallus containing 2,2'-di- <i>O</i> -methylstenosporic acid (with no more than traces of planaic acid) .....	<b>P. subplanaica</b>
26	Thallus K+ yellow then red, containing norstictic acid .....	27
26:	Thallus K-, not containing norstictic acid.....	28
27	Ascospores 45–55 µm long; thallus not containing 4,5-dichlorolichexanthone.....	<b>P. norfolkensis</b>
27:	Ascospores 67–85 µm long; thallus containing 4,5-dichlorolichexanthone.....	<b>P. undulata</b>
28	Thallus Pd+ orange-red, containing protocetraric acid.....	<b>P. errinundrensis</b>
28:	Thallus Pd-, not containing protocetraric acid absent.....	29
29	Thallus sorediate, containing thiophanic and stictic acids; soredia yellow .....	<b>P. xanthosorediata</b>
29:	Thallus esorediate .....	30
30	Thallus UV+ yellow, containing lichexanthone and stictic acid .....	31
30:	Thallus UV-; lichexanthone absent .....	32
31	Thallus containing 2,2'-di- <i>O</i> -methylstenosporic acid.....	<b>P. alboaspera</b> var. <b>alboaspera</b>
31:	Thallus not containing 2,2'-di- <i>O</i> -methylstenosporic acid .....	<b>P. dehiscens</b>
32	Thallus containing 4,5-dichlorolichexanthone.....	33
32:	Thallus not containing 4,5-dichlorolichexanthone .....	35
33	Thallus containing divaricatic acid.....	<b>P. pseudothwaitesii</b>
33:	Thallus not containing divaricatic acid .....	34
34:	Thallus containing stictic acid .....	<b>P. leiocarpella</b>
34	Thallus not containing stictic acid .....	<b>P. rigida</b>
35	Thallus KC+ yellow-orange.....	36
35:	Thallus KC-.....	38
36	Thallus containing arthothelin and 6- <i>O</i> -methylarthothelin, not thiophanic acid .....	<b>P. oblongata</b>
36:	Thallus containing thiophanic acid, not arthothelin or 6- <i>O</i> -methylarthothelin .....	37
37	Thiophanic acid alone present.....	<b>P. thiophanicina</b>
37:	Both thiophanic and stictic acids present .....	<b>P. texana</b>
38	Thallus not containing chlorolichexanthenes .....	39
38:	Thallus containing chlorolichexanthenes and stictic acid.....	40
39	Thallus containing 2- <i>O</i> -methylstenosporic acid, but not divaricatic or stictic acids .....	<b>P. leucoplaca</b>
39:	Thallus containing divaricatic and stictic acids, but not 2- <i>O</i> -methylstenosporic acid.....	<b>P. sydneyensis</b>
40	Thallus containing 2-chlorolichexanthone.....	<b>P. cryptostoma</b>
40:	Thallus containing di- and trichlorolichexanthenes .....	<b>P. lordhowensis</b>

**Pertusaria albissima** Müll. Arg., *Flora* 67: 350 (1884)

T: locality unknown, New Zealand, *C.Knight s.n.*; lecto: G, *vide* A.W.Archer & J.A.Elix, *Mycotaxon* 5: 203–217(1994)

*Pertusaria leucodeoides* C.Knight, *nom. nud.*

Illustration: A.W.Archer & J.A.Elix, *Australas. Lichenol.* 67: 20, figs 7, 8 (2010).

Thallus corticolous, off-white, smooth and dull, lacking isidia and soredia. Apothecia concolorous with the thallus, conspicuous, numerous, verruciform, sometimes confluent, flattened-hemispherical, 1–2 mm diam.; ostioles inconspicuous, pale, translucent. Ascospores 8 per ascus, hyaline, uniseriate, ellipsoidal, smooth, 50–74 × 20–26 µm.

*Chemistry*: no lichen compounds detected.

A rare, coastal, corticolous species in N.S.W.; also in New Zealand and the Auckland Islands.

N.S.W.: Queens Head Area, Limeburners Creek Nature Reserve, 15 km S of Crescent Head, *J.A.Elix 43610* (CANB).

*Pertusaria albissima* is characterised by the verruciform apothecia with inconspicuous ostioles, the absence of lichen compounds and, in particular, the eight uniseriate ascospores. The species is corticolous in New Zealand and Australia, but has been reported growing on rock in the Auckland Islands. *Casuarina* bark, is the only known substratum in Australia.

**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, 80–85 × 30–35 µm.

*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 boweniana*** A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 48 (1997)

T: Stony Ck, Bowenia S.F., 25 km NNW of Yeppoon, Qld, 22°55'S, 150°39'E, 24 Aug. 1993, *J.A.Elix 34570*; holo: CANB.

Illustration: A.W.Archer, *op. cit.* 49, fig. 10.

Thallus off-white, thin, cracked, smooth and dull. Soredia and isidia absent. Apothecia scattered, verruciform, rarely confluent, hemispherical, concolorous with the thallus, 0.5–0.8 mm diam. Ostioles inconspicuous, black, punctiform, 1 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal to subfusiform, 60–70 × 25–30 µm.

*Chemistry*: Thallus K–, KC–, C–, Pd–; containing 2'-*O*-methylstenosporic acid (major), 2-chlorolichexanthone (minor), 2'-*O*-methylperlatolic acid (trace) and 2'-*O*-methyldivaricatic acid (trace).

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

This species is characterised by 8-spored asci and the presence of 2-chlorolichexanthone and 2'-*O*-methylstenosporic acid in the thallus. It is distinguished from *P. praetermissa* (*q.v.*) by smaller ascospores and 2-chlorolichexanthone.

***Pertusaria complanata*** A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 53 (1997)

T: c. 3 km W of Laurieton, North Brother State Forest, N.S.W., 31°39'S, 152°47'E, 12 Oct. 1993, *A.W.Archer P600*; holo: NSW.

Illustration: A.W.Archer, *op. cit.* 49, fig. 12 (1997).

Thallus off-white, thin, diffuse, smooth and glossy. Soredia and isidia absent. Apothecia conspicuous, scattered, verruciform, sometimes confluent, strongly flattened-hemispherical, concolorous with the thallus, 1–2 mm diam. Ostioles inconspicuous, pale, translucent, 1 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, 45–50 × 22–25 µm.

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

A rare, endemic, corticolous species that is known from two localities in eastern N.S.W.

N.S.W.: W side of Piles Ck, 7 km W of Gosford, *A.W.Archer P234* (NSW).

The lichen is characterised by asci with 8 comparatively small ascospores and the presence of chlorolichexanthenes and perlatolic acid derivatives in the thallus.

***Pertusaria cryptostoma*** Müll.Arg., *Flora* 71: 206 (1888)

T: Lydenberg, Transvaal, South Africa, 1885, *Dr Wilms 24*; holo: G.

*Pertusaria limbata* Vain., *Acta Soc. Fauna Fl. Fenn.* 7: 110 (1890). T: Rio de Janeiro, Brazil, 1885, *E.A.Vainio (Lich. Bras. Exsicc.* 208); holo: TUR-V 6719; iso: UPS.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 92, fig. 30 (1997), as *P. limbata*.

Thallus pale olive-green, cracked and areolate, smooth and dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, flattened-hemispherical, concolorous with the thallus, scattered, sometimes confluent, becoming constricted at the base, 0.7–1.2 mm diam. Ostioles inconspicuous, pale, translucent, 1 or 2 per verruca, sometimes fusing to form a sunken translucent disc. Ascospores 8 per ascus, irregularly biseriate, ellipsoidal to subfusiform, smooth, 65–75 (–80) × 25–30 µm.

*Chemistry*: Thallus K–, KC–, C–, Pd–; containing 2-chlorolichexanthone (major), stictic acid (major) and constictic acid (minor).

An uncommon, corticolous species in eastern Qld and north-eastern N.S.W.; also in Lord Howe Is., southern Africa and Brazil.

Qld: Daintree Ferry, *W.H.Ewers 8385* (CANB); Carnarvon Natl Park, 91 km NNW of Injune, *J.A.Elix 34075* (CANB); Moreton, 4 km N of Richmond Gap, *A.W.Archer P418* (NSW). N.S.W.: Antarctic Beech Lookout, Border Ranges Natl Park, *A.W.Archer P428* (NSW); 3 km SW of Evans Head, Bundjalung Natl Park, *A.W.Archer P529* (NSW).

The species is characterised by the asci with 8 biseriate ascospores and the presence of 2-chlorolichexanthone and stictic acid in the thallus. It is distinguished from the chemically similar *P. delicatula* Müll.Arg., from Brazil, by the smaller ascospores (55–65 µm long) of the latter. The chemically similar *P. torquatella* Müll.Arg., also described from Brazil, has black ostioles.

This was previously reported from Australia under the more recent synonym *P. limbata*.

#### ***Pertusaria dehiscens* Müll.Arg., *Flora* 67: 349 (1884)**

T: Apiahy, Brazil, July 1882, *J.I.Puiggari 499 p.p.*; lecto: G; *vide* Oshio, *in sched.*

Thallus pale to dark olive-green, dull, wrinkled and cracked. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, concolorous with the thallus, flattened-hemispherical, 0.8–1.5 mm diam. Ostioles black, punctiform, 2–5 per verruca, in a hyaline zone that becomes rather conspicuous, deeply concave and almost disciform, to 0.8 mm diam. Ascospores 8 per ascus, biseriate, fusiform, smooth, 100–140 (–150) × 35–50 µm.

The corticolous species is characterised by the concave tops of the verrucae, asci with 8 biseriate ascospores and the presence of lichexanthone and stictic acid in the thallus. It is distinguished from other Australian *Pertusaria* species with 8 biseriate ascospores by the presence of lichexanthone.

Two varieties are recognised.

Thallus containing sekikaic acid..... **b. var. sekikaica**  
Thallus not containing sekikaic acid..... **a. var. dehiscens**

#### **a. *Pertusaria dehiscens* Müll.Arg. var. *dehiscens***

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 61, fig. 14 (1997).

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

A widely distributed variety which occurs in eastern Qld and north-eastern N.S.W.; also in Norfolk Island, Brazil and India.

Qld: Clarke Ra., 46 km S of Proserpine, *J.A.Elix 18682* (CANB); Mt Baldy, 4 km SW of Atherton, *J.A.Elix 16246* (CANB). N.S.W.: Mt Naardi, 30 km N of Lismore, *A.W.Archer P398* (NSW); Toonumbar S.F., 26 km NW of Kyogle, *A.W.Archer P454* (NSW); Gibraltar Ra., 90 km E of Glen Innes, *H.Perich* (COLO L-15278).

**b. *Pertusaria dehiscens* var. *sekikaica*** A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 57 (1997)

T: Foxtail Rd, Toonumbar State Forest, c. 26 km NW of Kyogle, N.S.W., 28°28'S, 152°47'E, 10 Sept. 1992, A.W.Archer P377; holo: NSW.

Morphologically very similar to var. *dehiscens*.

*Chemistry*: Thallus K–, KC–, C–, Pd–, UV+ yellow; containing lichexanthone (major), sekikaic acid (minor) and constictic acid (trace).

This endemic variety is known only from the type locality in north-eastern N.S.W.

***Pertusaria endoxantha*** Vain., *Hedwigia* 37: 41 (1898)

T: Kikuyu, Uganda (sic), [Kenya], G.F.Scott-Elliott 34a p.p.; holo: TUR-V 6812.

*Pertusaria norstictica* A.W.Archer, *Mycotaxon* 41: 232 (1991). T: Campania, 27 km N of Hobart, Tas., on *Acacia mearnsii* in open woodland, 22 Mar. 1981, G.Kantvilas 211/81; holo: HO.

Illustrations: A.W.Archer, *Biblioth. Lichenol.* 69: 106, fig. 36 (1997), as *P. norstictica*; A.W.Archer, J.A.Elix, E.Fischer, D.Killmann & E.Sérusiaux, *Nova Hedwigia* 88: 312, fig. 1C, D (2009).

Thallus off-white to pale olive-green, areolate and cracked, dull. Soredia and isidia absent. Apothecia numerous, verruciform, scattered, rarely confluent, flattened-hemispherical, concolorous with the thallus, 1–2 mm diam. Ostioles black, punctiform, inconspicuous in a hyaline zone 0.2–0.3 mm diam., 1–3 per verruca. Ascospores 8 per ascus, regularly or irregularly uniseriate, elongate-ellipsoidal to subfusiform, smooth, 60–95 × 20–37 µm.

*Chemistry*: Thallus K+ yellow then red, KC–, C–, Pd+ yellow; containing norstictic acid (major) and connorstictic acid (trace).

A widely distributed but uncommon corticolous species in Qld, N.S.W. and Tas.; also in East Africa, Indonesia and Papua New Guinea.

Qld: Black Mtn, 25 km NW of Kuranda, H.Streimann 31137 (CANB); Bunya Mtns, 56 km NE of Dalby, J.Hafellner 18935 (GZU). N.S.W.: Toonumbar S.F., 26 km NW of Kyogle, A.W.Archer P435 (NSW); Minyon Falls, 25 km NE of Lismore, D.Verdon 3935 (CANB); Mount Wilson, K.Kalb 20467 (Herb. K.Kalb).

*Pertusaria endoxantha* is characterised by asci with 8 uniseriate ascospores and by norstictic acid in the thallus. It was previously known from Australia as *P. norstictica* A.W.Archer. It has also been reported from Africa under the later names *P. macrostomoides* C.W.Dodge and *P. prolifera* C.W.Dodge.

***Pertusaria errinundrensis*** A.W.Archer, *Mycotaxon* 41: 226 (1991)

T: Goonmirks Rocks Rd, Errinundra Flora Reserve, 13 km S of Bendoc, Vic., 37°16'S, 148°53'E, 10 Apr. 1986, H.Streimann 36621; holo: CANB; iso: B.

Illustration: A.W.Archer, *op. cit.* 229, fig. 3.

Thallus thin, pale yellow, granular to tuberculate, dull. Soredia and isidia absent. Apothecia inconspicuous, verruciform, irregularly hemispherical, concolorous with the thallus, 0.7–1.4 mm diam. Ostiole uncommon, inconspicuous, black, punctiform, 1 per verruca. Ascospores 8 per ascus, ellipsoidal to subfusiform, biseriolate, 70–95 × 28–37 µm.

*Chemistry*: Thallus K–, KC–, C–, Pd+ orange-red; containing protocetraric acid (major).

A rare, endemic, corticolous species from south-eastern Vic.; known only from the type locality.

The species is characterised by 8-spored asci and protocetraric acid in the thallus.

***Pertusaria globospora*** A.W.Archer, *Mycotaxon* 45: 420 (1992)

T: Duncombe Bay Rd, near entrance to Mount Pitt Reserve, Norfolk Island, 29°00'30"S, 167°56'00"E, alt. 50 m, on felled *Araucaria heterophylla*, 7 Dec. 1984, J.A.Elix 18719; holo: CANB.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 214, fig. 82 (1997)

Thallus olive-green, thin, cracked, smooth and glossy, lacking isidia and soredia. Apothecia numerous, verruciform, conspicuous, concolorous with the thallus, rarely confluent, initially subconical, becoming strongly flattened-hemispherical, 0.5–1.0 mm diam. Ostioles conspicuous, initially protruding, black, 0.10–0.15 mm wide, in a hyaline zone 0.45–0.6 (–0.8) mm diam. Ascospores 8 per ascus, uniseriate, globose, smooth, 17–20 µm diam.; wall 4–5 µm thick.

*Chemistry*: K+ yellow then red, KC–, C–, Pd+ yellow; containing norstictic acid (major) and connorstictic acid (trace).

This rare, endemic corticolous species is known only from two localities in Norfolk Island.

Norfolk Island: Selwyn Pine Rd, *H.Streimann 34603* (CANB).

*Pertusaria globospora* is characterised by the globose ascospores, the conspicuous ostioles and the presence of norstictic acid.

***Pertusaria gundermanica*** A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 72 (1997)

T: 1.5 km N of Gunderman, c. 48 km NNW of Sydney, N.S.W., 33°26'S, 151°04'E, 16 Sept. 1991, *A.W.Archer P233*; holo: NSW.

Illustration: A.W.Archer, *op. cit.* 76, fig. 19.

Thallus pale fawn, thin, cracked, smooth and dull. Soredia and isidia absent. Apothecia numerous, conspicuous, scattered, rarely confluent, verruciform, concolorous with the thallus, flattened-hemispherical, 0.6–1.0 mm diam. Ostioles inconspicuous, black, punctiform, 1 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, 45–50 × 22–25 µm.

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

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

*Pertusaria gundermanica* is characterised by asci with 8 comparatively small ascospores and the presence of chlorolichexanthenes, 2-*O*-methylperlatolic acid and stictic acid in the thallus.

***Pertusaria injuneana*** A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 81 (1997)

T: Carnarvon Hwy, 4 km S of Bullaroo River Bridge, 68 km N of Injune, Qld, 25°14'S, 148°36'E, 19 Aug. 1993, *J.A.Elix 34083*; holo: CANB.

Illustration: A.W.Archer, *op. cit.* 76, fig. 23.

Thallus dull yellow, thin, somewhat areolate, minutely tuberculate and occasionally rather glossy. Soredia and isidia absent. Apothecia verruciform, conspicuous, scattered, rarely confluent, concolorous with the thallus, flattened-hemispherical, 0.8–1.5 mm diam. Ostioles conspicuous, mammiform, translucent in a pale yellow zone, 1 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, smooth, 60–70 × 22–30 µm.

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

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

*Pertusaria injuneana* has asci with 8 uniseriate ascospores and thiophaninic and perlatolic acids in the thallus. It resembles *P. xylophyes* both chemically and morphologically, but *P. xylophyes* contains 2-*O*-methylperlatolic acid.

**Pertusaria leiocarpella** Müll.Arg., *Bull. Herb. Boissier* 3: 636 (1895)

T: Qld, *s. loc.*, 1887, *C.Knight 11*; holo: G.

Thallus pale yellowish grey to pale greenish grey, minutely cracked and areolate, wrinkled and dull. Soredia and isidia absent. Apothecia verruciform, conspicuous, scattered, flattened-hemispherical, often irregular in outline, 0.4–0.8 mm diam. Ostiole translucent, inconspicuous, pale, becoming dark at the centre, 1 per verruca. Ascospores 8 per ascus, irregularly uniseriate to biseriate, ellipsoidal, smooth, 55–80 × 25–35 µm.

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

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

N.T.: below Florence Falls, Litchfield Natl Park, 42 km SW of Batchelor, *J.A.Elix 37713* (CANB). Qld: Keppel Sands, near Rockhampton, *R.W.Rogers 895* (BRI).

*Pertusaria leiocarpella* is characterised by asci with 8 biseriate ascospores, translucent ostioles and a distinctive thallus chemistry. It is chemically similar to *P. stenostoma* Vain. from Japan, but the ascospores of that species are fusiform and 80–100 µm long.

**Pertusaria leioplacella** Nyl., *Bull. Soc. Linn. Normandie*, sér. 2, 2: 71 (1867)

T: Lifu, New Caledonia, 1863, *E.Marie*; lecto: H-NYL 23640, *vide* Awasthi & Srivastava, *in sched.*; isolecto: H-NYL 23643.

*Pertusaria amblyogona* Müll.Arg., *Bull. Herb. Boissier* 3: 638 (1895). T: Toowoomba, Qld, 1894, *C.Hartmann s.n.*; holo: G.

*Pertusaria confluens* Müll.Arg., *Bull. Herb. Boissier* 3: 638 (1895). T: Toowoomba, Qld, 1894, *C.Hartmann s.n.*; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 92, fig. 26 (1997).

Thallus off-white to pale yellowish white or pale yellow, areolate and cracked, smooth and dull. Soredia and isidia absent. Apothecia numerous, verruciform, scattered, sometimes confluent, flattened-hemispherical, concolorous with the thallus, 0.5–1.0 (–1.5) mm diam. Ostiole inconspicuous or translucent, pale to medium yellow, conspicuous, 1 per verruca. Ascospores (6–) 8 per ascus, irregularly uniseriate, ellipsoidal, smooth, 52–72 × 28–32 µm.

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

Occurs in W.A., N.T., Qld, N.S.W. and Tas.; this common, subtropical, corticolous species is also known from South Africa, Papua New Guinea, New Caledonia, Vanuatu, the Hawaiian Islands, Central America, the Caribbean and South America.

W.A.: Cape Leveque, North Dampier Penin., *K.F.Kenneally 7628E* (PERTH). N.T.: Berry Springs, near Darwin, *A.C.Beaglehole* (MEL). Qld: Bruce Hwy, 52 km SE of Rockhampton, *D.Verdon 5227* (CANB, H). N.S.W.: Richmond R., Sept. 1900, *W.W.Watts s.n.* (NSW). Tas.: Flinders Is., Bass Str., *J.Whinray* (MEL).

The species is characterised by the pale yellow thallus, asci with 8 ascospores and by the chemistry of the thallus. It can be separated from the somewhat similar *P. gibberosa* by the yellow ostioles and the presence of thiophanic acid.

**Pertusaria leucoplaca** Müll.Arg., *Flora* 67: 304 (1884)

T: Apiahy, Brazil, Oct. 1882, *J.I.Puiggari 2128*; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 92, fig. 27 (1997).

Thallus greyish white, areolate and cracked, smooth and dull. Soredia and isidia absent. Apothecia verruciform, conspicuous, scattered, flattened-hemispherical, occasionally constricted at the base, concolorous with the thallus, sometimes slightly concave above, 0.8–1.5 mm diam.



Ostioles conspicuous, pale to dark brown or black, 1 (or 2) per verruca. Ascospores 8 per ascus, biseriate or irregularly biseriate, subfusiform to fusiform, smooth, 70–90 (–100) × 25–35 µm.

*Chemistry*: Thallus K–, KC–, C–, Pd–; containing 2-*O*-methylstenosporic acid (major), 2-*O*-methylperlatolic acid (minor) and 2-*O*-methyldivaricatic acid (trace).

An uncommon species found on bark in temperate rainforest in south-eastern N.S.W. and Vic.; also in Brazil and India.

N.S.W.: Olney S.F., c. 25 km W of Morisset, A.W.Archer P116 (NSW); Upper Kangaroo River road, 9 km S of Robertson, H.Streimann 35796 (B, CANB); Murramarang Natl Park, 10 km N of Batemans Bay, A.W.Archer P301 (NSW). Vic.: Laughton Gully, Mar. 1889, F.R.M.Wilson s.n. (NSW).

The lichen is characterised by asci with 8 biseriate ascospores and the presence of 2-*O*-methylstenosporic acid.

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

T: Cunninghams Gap, Qld, 1883, C.Hartmann s.n.; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 92, fig. 28 (1997).

Thallus pale olive-green, coarsely cracked and areolate, somewhat wrinkled, minutely tuberculate and dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, scattered, rarely confluent, slightly flattened-hemispherical, not constricted at the base, 1.0–1.5 mm diam. Ostiole inconspicuous, initially pale, becoming darker, 1 per verruca. Ascospores 8 per ascus, irregularly uniseriate, subfusiform to ellipsoidal, 75–105 × 30–45 µm.

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

An endemic, corticolous species in eastern Qld and N.S.W.; often found on *Casuarina* beside lakes and rivers.

Qld: Natural Arch Natl Park, J.A.Elix 1120 (CANB). N.S.W.: L. Mummuga, Bodalla S.F., A.W.Archer P553 (MEL, NSW); Murray Scrub Lookout, Toonumbar S.F., 28 km WNW of Kyogle, A.W.Archer P396 (NSW, PERTH); Glenbrook Ck, Blue Mountains Natl Park, K.Kalb 18872, 20513 (Herb. K.Kalb).

*Pertusaria leucostigma* is characterised by asci with 8 fusiform ascospores and the presence of lichexanthone and 2-*O*-methylperlatolic acid in the thallus. This chemistry distinguishes it from the morphologically similar *P. subrigida*.

### ***Pertusaria leucostomoides* Zahlbr., *Cat. Lich. Univ.* 5: 172 (1928)**

*Pertusaria leucostoma* Müll.Arg., *Bull. Herb. Boissier* 3: 636 (1895), *nom. illeg., non P. leucostoma* (Bernh.) A.Massal, *Ric. Auton. Lich. Crost.* 188 (1852). T: Toowoomba, Qld, 1894, C.Hartmann s.n.; holo: G.

Thallus off-white to pale olive-green, slightly cracked, smooth and dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, scattered, slightly flattened-hemispherical to subconical, rarely confluent, not constricted at the base, 0.4–0.8 mm diam. Ostioles conspicuous, white, 1 (–2) per verruca. Ascospores (4–) 8 per ascus, irregularly uniseriate, ellipsoidal, smooth, 65–70 × 25–32 µm.

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

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

*Pertusaria leucostomoides* is characterised by the predominantly 8-spored asci, the chemistry of the thallus and the distinctive, white ostioles. However, it is possible that the appearance of the ostioles is a result of fungal parasitism; otherwise the type specimen is very similar to *P. leiocarpella*.

***Pertusaria lordhowensis* A.W.Archer & Elix, *Telopea* 6: 18 (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* 32878; holotype: CANB.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 16, fig. 3.

Thallus pale olive-green, cracked and areolate, smooth and dull, lacking isidia and soredia. Apothecia verruciform, inconspicuous, numerous, scattered, flattened-hemispherical, concolorous with the thallus, 0.5–0.8 mm diam. Ostiole conspicuous, dark brown, 1 per verruca. Ascospores 8 per ascus, biseriate, ellipsoidal, smooth, (50–) 60–75 × 25–30 µm.

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

An endemic corticolous species known from south-eastern Qld and Lord Howe Island.

Qld: Burtons Well walking track to Mt Kiangarow, Bunya Mountains Natl Park, 68 km N of Dalby, *J.A.Elix* 37653 (CANB). Lord Howe Island: type locality, *J.A.Elix* 32873 (CANB).

The species is characterised by asci with eight biseriate ascospores and the presence of chlorinated lichexanthones. It is chemically similar to *P. xanthonaria* but that species has asci with two ascospores and lacks stictic acid.

***Pertusaria mattogrossensis* Malme, *Ark. Bot.* 28A: 22 (1936)**

T: Coxipó Mirim, prope Cuyabá [Cuiabá], Mato Grosso, Brazil, 1 June 1894, *G.O.A.Malme* 3916; holotype: S.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 106, fig. 32 (1997).

Thallus pale olive-green, thin, somewhat cracked, smooth and dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, scattered, rarely confluent, concolorous with the thallus, flattened-hemispherical, 0.7–1.5 (–2.0) mm diam. Ostioles inconspicuous, pale, translucent, 1 (–2) per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, 65–85 (–90) × 28–40 µm.

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

A very rare, corticolous species in north-eastern Qld; also known from Brazil and Paraguay.

Qld: Mt Baldy, 4 km SW of Atherton, *H.Streimann* 29187 (CANB).

The lichen is characterised by asci with 8 uniseriate ascospores and the presence of 2-*O*-methylperlatolic acid in the thallus.

***Pertusaria mesotropa* Müll.Arg., *Flora* 67: 350 (1884)**

T: Ceylon [Sri Lanka], 1876, *G.H.K.Thwaites s.n.*; holotype: G [Leighton, *Lich. Ceylon*. no. 67].

*Pertusaria paragibberosa* A.W.Archer, *Mycotaxon* 41: 236 (1991). T: Nonbah property, c. 4 km W of Hume Hwy, 20 km N of Holbrook, N.S.W., 31 May 1975, *R.Filson* 15364; holotype: MEL.

Illustration: A.W.Archer, *op. cit.* 229, fig. 6, as *P. paragibberosa*.

Thallus pale olive-green, wrinkled, somewhat cracked, dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, concolorous with the thallus, scattered or occasionally confluent, hemispherical to flattened-hemispherical, not constricted at the base, 0.5–1.5 mm diam. Ostioles inconspicuous, dark brown, punctiform, somewhat mammiform, 1 or 2 per verruca. Ascospores 8 per ascus, irregularly uniseriate or biseriate, elongate-ellipsoidal to subfusiform, smooth, 75–100 (–117) × 30–40 µm.

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

An uncommon but widely distributed corticolous species in Qld, N.S.W. and Vic.; also in Sri Lanka.

Qld: Four-Mile Beach, 1 km S of Port Douglas, *D.Verdon* 5443 (CANB); Dawes Ra., 53 km E of Biloela, *J.A.Elix* 345752 (CANB). N.S.W.: Chaelundi Mtn, 37 km N of Ebor, *D.Verdon* 3896 (CANB); Deniliquin S.F., *M.Fox* 8411123 (NSW). Vic.: Wangaratta, Nov. 1897, *F.R.M.Wilson s.n.* (NSW).

The species is characterised by 8-spored asci and the presence of 4,5-dichlorolichexanthone and 2'-*O*-methylperlatolic acid in the thallus. It is distinguished from the morphologically similar *P. novaehollandiae* and *P. paradoxica* which contain miriquidic acid and 4-*O*-methylisocryptochlorophaeic acid, respectively.

***Pertusaria minispora*** A.W.Archer & Elix, *Australas. Lichenol.* 65: 32 (2009)

T: Bemm River Scenic Reserve, 45 km E of Orbost, Vic., 37°37'30"S, 148°53'12"E, alt. 65 m, on bark of *Pomaderris*, 15 Apr. 2008, *J.A.Elix* 38692; holo: MEL.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 38, fig. 5.

Thallus off-white to pale olive-green, thin, smooth and dull, lacking isidia and soredia. Apothecia verruciform, scattered, flattened-hemispherical, 0.5–1.0 mm diam. Ostioles pale, inconspicuous, 1 or 2 per verruca. Ascospores 8 per ascus, hyaline, ellipsoidal, smooth, 36–46 × 14–17 µm.

*Chemistry*: containing 4,5-dichlorolichexanthone (major) and perlatolic acid (major).

This very rare corticolous species is known only from the type locality in eastern coastal Vic.

*Pertusaria minispora* is characterised by the small ascospores and the presence of perlatolic acid and 4,5-dichlorolichexanthone. It resembles the common *P. pertractata* (*q.v.*) in appearance and ascospore morphology, but is distinguished by the presence of perlatolic rather than 2'-*O*-methylperlatolic acid. Perlatolic acid derivatives are common in *Pertusaria*, but the parent compound is rarely found as a major substance (although it can occur in minor or trace amounts).

***Pertusaria norfolkensis*** A.W.Archer, in J.A.Elix, H.Streimann & A.W.Archer, *Proc. Linn. Soc. New South Wales* 113: 67 (1992)

T: Mount Pitt, Mount Pitt Reserve, Norfolk Island, 29°01'S, 167°56'E, alt. 300 m, on treelet stem in poor forest on gentle slope, 10 Dec. 1984, *H.Streimann* 34845; holo: CANB; iso: B.

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

Thallus off-white to pale yellowish white, areolate and cracked, rough and tuberculate, dull, lacking isidia and soredia. Apothecia verruciform, inconspicuous, concolorous with the thallus, irregularly hemispherical, not constricted at the base, sometimes confluent, 1–2 mm diam. Ostioles conspicuous, black, sunken, 1–4 per verruca. Ascospores 8 per ascus, biseriolate, smooth, ellipsoidal, 45–55 × 16–20 µm.

*Chemistry*: Thallus K+ yellow than red, KC–, C–, Pd+ yellow-orange; containing norstictic acid (major) and connorstictic acid (trace).

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

*Pertusaria norfolkensis* is characterised by asci with 8 small biseriolate ascospores and by the presence of norstictic acid. The chemically similar *P. endoxantha* has larger ascospores (60–95 × 20–37 µm).

***Pertusaria novaehollandiae*** A.W.Archer, *Mycotaxon* 44: 14 (1992)

T: Cockle Ck, c. 25 km N of Sydney, N.S.W., 33°40'S, 151°09'E, 25 Apr. 1990, *A.W.Archer* P107; holo: NSW.

Illustration: A.W.Archer, *op. cit.* 15, fig. 2.

Thallus pale greenish grey, slightly cracked, subtuberculate, smooth and glossy. Soredia and isidia absent. Apothecia numerous, verruciform, scattered, sometimes confluent, inconspicuous on rough substrata, concolorous with the thallus, flattened-hemispherical, not constricted at the base, 0.7–1.4 mm diam. Ostiole inconspicuous, pale fawn, occasionally becoming slightly mammiform, c. 0.1 mm diam., 1 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, becoming fusiform, smooth, 75–95 × 30–45 µm.

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

An endemic, corticolous species in south-eastern N.S.W.

N.S.W.: L. Durass, Kioloa S.F., *A.W.Archer P284* (NSW); near Diamond Head, Crowdy Bay Natl Park, *A.W.Archer P605* (CANB, NSW); S side of Queens L., Laurieton, *A.W.Archer P613* (NSW); Tomaga R. estuary, 1 km S of Tomakin, *J.A.Elix 23309* (CANB); Buckenbowra R. estuary, 7 km WNW of Batemans Bay, *H.Streimann 27783* (CANB, H).

The species is characterised by verrucae with inconspicuous, pale fawn ostioles, 8-spored asci and the presence of miriquidic acid. This depside, first isolated from the genus *Miriquidica* (Lecanoraceae), has not been found in any other species of *Pertusaria*.

***Pertusaria oblongata* Müll.Arg., *Flora* 67: 401 (1884)**

T: Apiaty, Brazil, 1883, *J.I.Puiggari 1394*, 1883; holo: G

*Pertusaria howeana* A.W.Archer & Elix, *Telopea* 6: 15 (1994). T: Neds Beach Road at Malabar Hill Track, Lord Howe Is., 22 June 1992, *J.A.Elix 32889*; holo: CANB.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 16, fig. 2.

Thallus off-white to dull yellowish green, areolate and cracked, smooth. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, scattered, flattened-hemispherical, sometimes becoming constricted at the base and distorted, 0.8–1.5 (–2.0) mm diam. Ostioles inconspicuous, black or translucent, 1 (or 2) per verruca. Ascospores 8 per ascus, irregularly biserial, ellipsoidal to subfusiform, (65–) 75–87 × 30–35 µm.

*Chemistry*: Thallus K–, KC+ yellow-orange, C+ yellow-orange, Pd–; containing arthothelin (major), 6-*O*-methylarthothelin (major), 2,5-dichloronorlichexanthone (minor), 2,7-dichloronorlichexanthone (minor) and 4,5-dichloronorlichexanthone (trace).

An uncommon, corticolous species in eastern N.S.W.; also in Lord Howe Island and Papua New Guinea.

N.S.W.: Sawtell, c. 6 km S of Coffs Harbour, *A.W.Archer P888* (NSW); track to Resolute Beach, Ku-ring-gai Chase Natl Park, *A.W.Archer P803* (NSW).

The lichen is characterised by asci with 8 biserial ascospores and the presence of chlorinated norlichexanthenes in the thallus. It resembles *P. bartlettii* A.W.Archer & Elix, from New Zealand, but the two differ in their chemistry: *P. bartlettii* contains thiophanic acid in place of the 6-*O*-methylarthothelin of *P. howeana*. *Pertusaria howeana* is chemically identical to *P. idukkiensis* Awasthi & Srivastava from India, but the ascospores in the latter are 112–212 µm long.

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

T: Orara State Forest, 23 km WNW of Coffs Harbour, N.S.W., 30°15'S, 152°55'E, 17 Sept. 1996, *A.W.Archer P857*; holo: NSW.

Illustration: A.W.Archer, *op. cit.* 123, fig. 37.

Thallus pale greenish grey, thin, smooth and slightly glossy. Soredia and isidia absent. Apothecia inconspicuous, verruciform, scattered, rarely confluent, flattened-hemispherical, concolorous with the thallus, 1.0–1.5 mm diam. Ostiole inconspicuous, black, punctiform, 1 per verruca. Ascospores 8 per ascus, irregularly biserial, ellipsoidal to subfusiform, 70–92 × 25–33 µm.

*Chemistry*: Thallus K–, KC–, C–, Pd–; containing divaricatic acid (major), 2-chlorolichexanthone (minor), methyl 2,2'-di-*O*-methyldivaricatate (minor) and methyl 2-*O*-methyldivaricatate (trace).

An endemic, corticolous species that is known from two localities in north-eastern N.S.W.

N.S.W.: Orara S.F., 7 km NNE of Coffs Harbour, *A.W.Archer P851* (NSW).

The species is characterised by 8-spored asci and the presence of 2-chlorolichexanthone and divaricatic acid in the thallus. Divaricatic acid is also found in *P. pseudothwaitesii* and *P. sydneyensis*.

**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 pertractata** Stirt., *Trans. Glasgow Soc. Field Naturalists* 4: 93 (1876)

T: 'ad ligna decorticata', Tas., 1871, *H.Paton*; holo: BM.

*Pertusaria woollisiana* Müll.Arg., *Flora* 65: 485 (1882). T: Parramatta, N.S.W., 1879, *W.Woolls s.n.*; holo: G; iso: MEL 7288.

*Pertusaria gibberosa* Müll. Arg., *Flora* 65: 486 (1882). T: Tas., 1882, *F.Mueller s.n.*; holo: G; iso: M.

*Pertusaria virginea* Müll.Arg., *Flora* 65: 486 (1882). T: Parramatta, N.S.W., 1879, *W.Woolls s.n.*; holo: G.

*Pertusaria moffatiana* Müll.Arg., *Flora* 66: 79 (1883). T: Mount Macedon, Vic., 1882, *Moffat*; holo: G.

*Pertusaria nitidula* Müll.Arg., *Bull. Herb. Boissier* 1: 42 (1893). T: Vic., *s. loc.*, *F.R.M.Wilson 468*; holo: G.

*Pertusaria graphidioides* Müll.Arg., *Bull. Herb. Boissier* 1: 42 (1893). T: Doncaster, Vic., *F.R.M. Wilson* 492; holo: G.

*Pertusaria microspora* Müll.Arg., *Bull. Herb. Boissier* 3: 637 (1895); *P. microsporella* Zahlbr., *Cat. Lich. Univ.* 5: 180 (1928), *nom. superfl.* T: Loutit Bay, Vic., *Luehmann s.n.*; lecto: G, *fide* A.W.Archer, *Telopea* 4: 169 (1991).

[*Pertusaria communis* auct. non DC.: F.R.M.Wilson, *Victorian Naturalist* 4: 87 (1887)]

[*Pertusaria leioplaca* var. *gibbosa* auct. non Müll.Arg.: J.Müller, *Nuovo Giorn. Bot. Ital.* 23: 391 (1891)]

[*Pertusaria leioplaca* var. *octospora* auct. non Nyl.: J.Müller, *Nuovo Giorn. Bot. Ital.* 23: 391 (1891)]

[*Pertusaria melaleuca* var. *octospora* auct. non Müll.Arg.: J.Müller, *Ann. K.K. Naturhist. Hofmus.* 7: 304 (1892)]

[*Pertusaria anarithmetica* auct. non Müll.Arg.: J.Müller, *Bull. Herb. Boissier* 1: 41 (1893)]

Illustrations: G.Kantvilas, *Lichenologist* 22: 291, fig. 1A (1990); A.W.Archer, *Fl. Australia* 56A: 103, pl. 43, 44 (2004), all as *P. gibberosa*.

Thallus variable, thin and discontinuous to thick and continuous, off-white or greyish white to yellowish white, slightly cracked to areolate, smooth or slightly wrinkled, dull. Soredia and isidia absent. Apothecia numerous, scattered or occasionally confluent, conspicuous, verruciform, flattened-hemispherical, becoming constricted at the base, 0.5–1.5 mm diam. Ostioles pale brown to black, 1–4 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, smooth, 32–65 (–70) × 20–35 µm. Pycnidia rare, 1–3 immersed in verrucae, 0.05 mm diam., black. Conidia narrowly fusiform, c. 10 × 1 µm.

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

The most common and widely distributed corticolous *Pertusaria* species in Australia (in all States and Territories except N.T.); it is especially common in the south-east. Possibly endemic, but one doubtful specimen is known from Vanuatu.

W.A.: Port Manning, Perth, *N.Sammy* (PERTH 02341794). S.A.: Mt Lofty, 12 km SE of Adelaide, *H.Streimann 9781* (B, CANB, H). Qld: Chermiside, Brisbane, *R.W.Rogers 4077* (BRI). N.S.W.: Terry Ck, 32 km SW of Singleton, *J.A.Elix 33830* (CANB). A.C.T.: near Musk Ck crossing, Blue Ra., *J.Curnow 365* (CANB). Vic.: Mt Cope, Bogong High Plains, *A.C.Beaglehole 15580* (MEL). Tas.: Newton Falls, Bally Park, near Sorell, *G.C.Bratt 3094* (COLO, HO).

The species is characterised by the off-white to greyish white thallus, the distinctive chemistry and, especially, the abundant, fertile asci each containing 8 uniseriate ascospores.

#### ***Pertusaria planaica* A.W.Archer & Elix, *Mycotaxon* 45: 421 (1992)**

T: W of road from Goondiwindi to Miles, 63.5 km N of Goondiwindi, Qld, 28°00'S, 150°20'E, 2 Sept. 1986, *J.Hafellner 18715*; holo: GZU.

Thallus pale greenish grey, slightly cracked and subtuberculate, smooth and glossy, lacking soredia and isidia. Apothecia inconspicuous, verruciform, dispersed, sometimes confluent, concolorous with the thallus, flattened-hemispherical, not constricted at the base, 0.5–0.8 mm diam. Ostiole inconspicuous, black, 1 per verruca. Ascospores 8 per ascus, irregularly uniseriate, ellipsoidal, becoming fusiform, smooth, 80–100 × 25–35 µm.

**Chemistry:** Thallus K–, KC–, C–, Pd–; containing 4,5-dichlorolichexanthon (major) and planaic acid (major).

A rare, endemic, corticolous species in rainforest in Qld and N.S.W.

N.S.W.: Barrington Tops Natl Park, *K.Kalb 21803* (Herb. K.Kalb).

The lichen is characterised by 8-spored asci and the presence of 4,5-dichlorolichexanthon and planaic acid in the thallus. It is distinguished from the chemically similar *P. leucothelia* by the 4 rough-walled ascospores in the latter.

**Pertusaria praetermissa** A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 130 (1997)

T: near Salvation Ck, N side of Lovett Bay, Ku-ring-gai Chase Natl Park, c. 25 km N of Sydney, N.S.W., 33°38'S, 151°16'E, 11 Dec. 1993, A.W.Archer P694; holo: NSW.

Illustration: A.W.Archer, *op. cit.* 132, fig. 45.

Thallus off-white, thin, smooth and glossy, lacking soredia and isidia absent. Apothecia numerous, verruciform, scattered, rarely confluent, flattened-hemispherical, 1.0–1.5 mm diam. Ostioles inconspicuous, translucent, 1 or 2 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, 70–80 × 30–35 µm.

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

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

*Pertusaria praetermissa* is characterised by 8-spored asci and the presence of 4,5-dichlorolichexanthone and 2'-*O*-methylstenosporic acid. It is distinguished from *P. boweniana* by the larger ascospores and the presence of 4,5-dichlorolichexanthone, and from *P. xenismota* by the larger ascospores and the absence of methyl 2-*O*-methylperlatolate.

**Pertusaria pseudothwaitesii** A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 133 (1997)

T: Antarctic Beech Lookout, Border Ranges Natl Park, N.S.W., 28°22'30"S, 153°05'30"E, 4 Sept. 1992, A.W.Archer P410; holo: NSW.

Thallus off-white, cracked, smooth and dull, lacking soredia and isidia. Apothecia conspicuous, verruciform, flattened-hemispherical, often confluent, 1.0–1.5 mm diam. Ostioles conspicuous, black, punctiform, (3–) 5–8 per verruca. Ascospores 8 per ascus, biseriata, ellipsoidal to subfusiform, 75–82 × 25–30 µm.

*Chemistry*: Thallus K–, KC–, C–, Pd–; containing 4,5-dichlorolichexanthone (major), divaricatic acid (minor) and atranorin (trace).

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

*Pertusaria pseudothwaitesii* is characterised by 8-spored asci and the presence of 4,5-dichlorolichexanthone and divaricatic acid. Divaricatic acid is an uncommon orcinol depside in *Pertusaria*; it is also found in *P. orarensis* and *P. sydneyensis*.

**Pertusaria rigida** Müll.Arg., *J. Linn. Soc., Bot.* 29: 221 (1893)

T: Manipoor [Manipur], India, G.Watt s.n., ex Herb. Kew 1891; holo: G.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 141, fig. 49 (1997).

Thallus pale greyish olive, minutely areolate and cracked, smooth and dull, lacking soredia and isidia. Apothecia numerous, verruciform, occasionally confluent, concolorous with the thallus, flattened-hemispherical, 0.8–1.5 mm diam. Ostioles conspicuous, black, punctiform, sometimes in a pale grey translucent zone (and inconspicuous), 1 (rarely 2) per verruca, more numerous in confluent verrucae. Ascospores 4–6 (–8) per ascus, irregularly uni- or biseriata, ellipsoidal to subfusiform, smooth, (60–) 65–80 (–90) × 25–38 µm.

*Chemistry*: K–, KC–, C–, Pd–; containing 4,5-dichlorolichexanthone (major), ±4,5-dichloro-3-*O*-methylnorlichexanthone (trace) and ±4,5-dichloro-6-*O*-methylnorlichexanthone (trace).

A predominantly inland, corticolous species in W.A., Qld and northern N.S.W.; also in India.

W.A.: along the road to The Loop and Z-Bend, Kalbarri Natl Park, 24 km NE of Kalbarri township, *J.A.Elix 33651* (CANB). Qld: Hervey Ra., 45 km SW of Townsville, *J.A.Elix 20437* (CANB); 5 km E of Injune, *J.A.Elix 34032* (CANB, MSC); 39 km NNW of Roma, *J.A.Elix 34102* (CANB). N.S.W.: Murray Scrub Lookout, Toonumbar S.F., *A.W.Archer P472* (NSW); track to The Needles, Gibraltar Range Natl Park, *A.W.Archer P474* (NSW).

*Pertusaria rigida* is characterised by 8-spored asci and 4,5-dichlorolichexanthone in the thallus. The chemically similar *P. irregularis* has 2-spored asci.

***Pertusaria subarida*** A.W.Archer & Elix, *Mycotaxon* 94: 134 (2005)

T: First North Rd, Wotto Nature Reserve, 21 km by road NE of Eneabba, W.A., 29°42'29"S, 115°24'37"E, alt. 275 m, on *Melaleuca* in woodland, 5 May 2004, *J.A.Elix 28871*; holo: PERTH, iso: CANB.

Thallus off-white to pale fawn, smooth and dull, somewhat rimose, lacking isidia and soredia. Apothecia verruciform, conspicuous, scattered, sometimes confluent, flattened-hemispherical, occasionally constricted at the base, 0.7–1.0 mm diam. Ostioles inconspicuous, black, punctiform, 1–4 per verruca. Ascospores 8 per ascus, hyaline, smooth-walled, 1-seriate, 40–65 × 18–32 µm.

*Chemistry*: containing planaic acid (major), 4,5-dichlorolichexanthone acid (minor), ±2,4,5-trichlorolichexanthone (trace), ±4-chlorolichexanthone (trace), ±4,5-dichloro-6-*O*-methylnorlichexanthone (trace), ±2'-*O*-methylperlatolic acid (trace), ±2-*O*-methylperlatolic acid (trace).

An uncommon corticolous lichen in subarid areas of south-western W.A.

W.A.: Gwambygine Nature Reserve, 11 km S of York, *J.A.Elix 31754* (CANB); Western Flora camp area, 20 km N of Eneabba, *E.McCrum WF257* (CANB, PERTH).

The species is characterised by asci with 8 relatively small ascospores and the presence of 4,5-dichlorolichexanthone and planaic acid as the major lichen substances.

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

T: Patterson R., N.S.W., Aug. 1906, *J.L.Boorman s.n.*; holo: NSW.

Illustration: A.W.Archer & J.A.Elix, *op. cit.* 419, fig. 5.

Thallus pale olive-green, somewhat cracked, smooth and dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, scattered or occasionally confluent, concolorous with the thallus, flattened-hemispherical, constricted at the base, 0.8–1.5 mm diam. Ostioles inconspicuous, pale brown, 1 per verruca. Ascospores 8 per ascus, irregularly uniseriate, smooth, at first ellipsoidal, becoming fusiform, (60–) 80–100 (–120) × 30–40 µm.

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

An uncommon, corticolous species of rainforest in south-eastern Qld and eastern N.S.W.; also in New Zealand and Papua New Guinea.

Qld: Dawes Ra., 53 km E of Biloela, *J.A.Elix 34752* (CANB); Mount Mee S.F., *J.Hafellner 16887* (GZU). N.S.W.: New England Natl Park, 72 km E of Armidale, *J.A.Elix 33930* (CANB); Upsalls Ck, Kerewong S.F., 35 km NNW of Taree, *A.W.Archer P675* (NSW); Bola Ck, Royal Natl Park, *K.Kalb 21690, 21700* (Herb. K.Kalb).

The lichen is characterised by 8-spored asci and the presence of 2,2'-di-*O*-methylstenosporic acid in the thallus. It is distinguished from the somewhat similar *P. mesotropa*, *P. novaehollandiae* and *P. planaica* (which contain 2'-*O*-methylperlatolic acid, miriquidic acid and planaic acid, respectively) by having 2,2'-di-*O*-methylstenosporic acid.



***Pertusaria subrigida* Müll.Arg., *Bull. Herb. Boissier* 3: 636 (1895)**

T: Brisbane, Qld, 1891, *F.M.Bailey 1570*; holo: G.

Thallus pale olive-green to pale greyish green, areolate and cracked, smooth to subtuberculate, dull. Soredia and isidia absent. Apothecia conspicuous, verruciform, scattered, flattened-hemispherical, becoming constricted at the base, concolorous with the thallus, 1–2 mm diam. Ostioles inconspicuous, black, often sunken, 1–3 per verruca. Ascospores (5–) 6–8 per ascus, irregularly uniseriate or biseriata, ellipsoidal to fusiform, smooth, 70–110 × 30–37 µm.

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

An uncommon, corticolous species in south-eastern Qld and eastern N.S.W.; also in Lord Howe Is. and Brazil.

Qld: Mt Bullen, Bunya Mtns, *K.Kalb 20249* (Herb. K.Kalb); Mt Glorious, D'Aguilar Ra., *D.Verdon 5171* (CANB). N.S.W.: Currawong S.F., 23 km NW of Batemans Bay, *J.A.Elix 21316* (CANB); Myall S.F., Buladelah, *K.Kalb 17938* (Herb. K.Kalb).

The lichen is characterised by the 8-spored asci and the absence of lichen compounds.

***Pertusaria sydneyensis* A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 147 (1997)**

T: mouth of Salvation Ck, N of Lovett Bay, Pittwater, 27 km N of Sydney, N.S.W., 33°38'S, 151°16'E, 26 Mar. 1994, *A.W.Archer P705*; holo: NSW.

Illustration: A.W.Archer, *op. cit.* 69: 141, fig. 54 (1997).

Thallus pale greyish white, thin, smooth and dull. Soredia and isidia absent. Apothecia inconspicuous, verruciform, scattered, rarely confluent, flattened-hemispherical, 0.5–0.8 mm diam. Ostiole inconspicuous, pale, 1 per verruca. Ascospores 8 per ascus, irregularly biseriata, ellipsoidal to subfusiform, (75–) 87–100 × 30–37 µm.

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

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

The lichen is characterised by 8-spored asci and the presence of divaricatic and stictic acids in the thallus. Divaricatic acid is an uncommon depside in Australian *Pertusaria* species; it is also found in *P. orarensis* and *P. pseudothwaitesii*.

***Pertusaria texana* Müll.Arg., *Flora* 67: 399 (1884)**

T: near Dallas, Texas, U.S.A., 1867, *H.N.Bolander*; holo: G.

Illustration: A.W.Archer & J.A.Elix, *Australas. Lichenol.* 67: 22, figs 13, 14 (2010).

Thallus pale yellowish white to pale fawn, cracked, smooth and dull, lacking isidia and soredia. Apothecia numerous, concolorous with the thallus, scattered, rarely confluent, 0.6–1.3 mm diam. Ostioles pale yellowish fawn, 1–3 per verruca. Ascospores 8 per ascus, biseriata, hyaline, ellipsoidal, 75–95 × 28–37 µm.

*Chemistry*: Thallus KC+ yellow-orange; containing thiophaninic acid (major), stictic acid (major) and constictic acid (minor).

A widely distributed corticolous species in eastern Qld and N.S.W.; also in the southern U.S.A., the Seychelles, Papua New Guinea and the Galapagos Islands.

Qld: Rocky Pt, 13 km NE of Mossman, *J.A.Elix 43422*, (CANB). N.S.W.: Findon Creek Rd, by side of Findon Ck, *A.W.Archer P478* (NSW); track beside Terrace Ck, Border Ranges Natl Park, *A.W.Archer P579* (NSW); beside Cockle Creek, Ku-rin-gai Chase Natl Park, c. 27 km NNW of Sydney, *A.W.Archer P754* (NSW); Park Beach, Coffs Harbour, *J.A.Elix 3415* (CANB); Temagog, *J.A.Elix 33163* (CANB).

*Pertusaria texana* is characterised by the verruciform apothecia, the pale yellowish ostioles, the 8 biseriate ascospores and the presence of thiophaninic and stictic acids. It resembles *P. thiophaninica* (*q.v.*), in morphology and ascospore size, but the latter lacks stictic acid.

***Pertusaria thiophaninica* A.W.Archer, *Mycotaxon* 41: 245 (1991)**

T: Ewans Ponds, S.A., 8 Mar. 1977, *R.B.Filson 15806*; holotype: MEL.

Illustration: A.W.Archer, *op. cit.* 243, fig. 9 (1991).

Thallus pale greenish yellow, thin, cracked, lacking soredia and isidia. Apothecia numerous, verruciform, flattened-hemispherical, concolorous with the thallus, often confluent, not constricted at the base, 0.5–1.0 mm diam. Ostiole conspicuous, pale to dark brown, in a hyaline to pale yellow translucent zone, 1 per verruca. Ascospores 8 per ascus, irregularly biseriate, elongate-ellipsoidal, smooth, 75–95 × 30–40 μm.

*Chemistry*: Thallus K–, KC+ yellow-orange, C+ yellow-orange, Pd–; containing thiophaninic acid (major), 4-chloro-6-*O*-methylnorlichexanthone (trace to minor) and 2-chloro-6-*O*-methylnorlichexanthone (trace).

An uncommon but widely distributed, endemic, corticolous species in W.A., S.A., Qld and Vic.

W.A.: Warren Natl Park, 11 km SW of Pemberton, *J.A.Elix 41247* (CANB). Qld: Mt Mowbray, Bunya Mountains Natl Park, *K.Kalb 20402* (Herb. K.Kalb). Vic.: Point Danger, Portland, *R.B.Filson 7323* (MEL).

The species is characterised by 8-spored asci and the presence of thiophaninic acid as the dominant lichen compound. It is distinguished from the somewhat similar *P. leioplacella* by the less conspicuous ostioles, the absence of stictic and hypostictic acids and the predominantly biseriate arrangement of the larger ascospores.

***Pertusaria undulata* Müll.Arg., *Hedwigia* 32: 126 (1893)**

T: Qld, *s. loc.*, *C.Hartmann s.n.*; holotype: G; isotype: BM.

Thallus off-white to pale yellowish white, coarsely cracked and areolate, dull and slightly rough. Soredia and isidia absent. Apothecia inconspicuous, verruciform, flattened-hemispherical or irregular in outline, becoming slightly constricted at the base, occasionally concave above, 0.4–0.6 mm diam. Ostioles inconspicuous, black, 1 or 2 per verruca. Ascospores 8 per ascus, irregularly biseriate, elongate-ellipsoidal to subfusiform, smooth, 67–85 × 27–35 μm.

*Chemistry*: Thallus K+ yellow then red, KC–, C–, Pd+ yellow; containing 4,5-dichlorolichexanthone (major), norstictic acid (major) and connorstictic acid (trace).

Endemic and corticolous in Qld and eastern N.S.W.

N.S.W.: Mylestom, E bank of Bellinger R., 20 km SSW of Coffs Harbour, *A.W.Archer P892* (NSW).

*Pertusaria undulata* is characterised by 8-spored asci and the presence of 4,5-dichlorolichexanthone and norstictic acid in the thallus.

***Pertusaria verruculifera* Vain., *Acta Soc. Fauna Fl. Fenn.* 7: 110 (1890)**

T: Sero do Caraça, Minas Gerais, Brazil, 5 Apr.–5 May 1885, *E.A.Vainio s.n.*, (*Lich. Bras. Exsicc.* 1464); lectotype: TUR-V 6751, *fide* A.W.Archer, *Biblioth. Lichenol.* 69: 160 (1997).

Illustration: A.W.Archer, *op. cit.* 163, fig. 63 (1997).

Thallus pale olive-green, wrinkled, cracked, slightly rough and dull. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, concolorous with the thallus, rarely confluent, hemispherical to flattened-hemispherical, 0.6–1.0 mm diam. Ostiole inconspicuous,

translucent, pale brown or black, punctiform, 1 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, smooth, 50–60 (–67) × (22–) 25–30 µm.

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

An uncommon, corticolous species in south-eastern Qld; also in Argentina and Brazil.

Qld: Mt Mee S.F., 60 km NW of Brisbane, *A.W.Archer P829* (NSW); Carnarvon Hwy, 68 km N of Injune, *J.A.Elix 34045, 34052* (CANB).

The species is characterised by asci with 8 uniseriate ascospores and the presence of lichexanthone, stictic acid and 2,2'-di-*O*-methylstenosporic acid. It is chemically identical to *P. alboaspera*, but that species has asci with 8 larger, biseriata ascospores.

***Pertusaria xanthosorediata*** A.W.Archer, *Mycotaxon* 41: 252 (1991)

T: Perseverance Dam, SE of Crows Nest, Qld, 27°17'S, 152°07'E, 4 Sept. 1986, *J.Hafellner 18663*; holotype: GZU.

Illustration: A.W.Archer, *op. cit.* 243, fig. 12.

Thallus off-white to dull yellow, somewhat cracked. Isidia absent. Soralia bright yellow, erumpent, irregularly rounded, 0.2–0.4 mm diam. Apothecia uncommon, verruciform, hemispherical, concolorous with the thallus, 0.5–0.8 mm diam. Ostiole inconspicuous, concolorous with the thallus, 1 per verruca. Ascospores 8 per ascus, irregularly biseriata, fusiform, smooth, 60–65 × 20–22 µm.

*Chemistry*: Thallus K–, KC+ orange, C+ weak orange, Pd–; containing thiophanic acid (major), stictic acid (major) and constictic acid (trace).

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

Characterised by the yellow thallus with bright yellow soralia, asci with 8 ascospores and the presence of thiophanic and stictic acids.

***Pertusaria xenismota*** A.W.Archer & Elix, in A.W.Archer, *Biblioth. Lichenol.* 69: 170 (1997)

T: Red Rock, S side of Corinda R., 38 km NNE of Coffs Harbour, N.S.W., 30°00'S, 153°15'E, 22 Nov. 1996, *A.W.Archer P889*; holotype: NSW.

Thallus off-white, thin, somewhat cracked, smooth and dull. Soredia and isidia absent. Apothecia numerous, verruciform, scattered, rarely confluent, flattened-hemispherical, concolorous with the thallus, 0.8–1.2 mm diam. Ostiole inconspicuous, pale grey, translucent, 1 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal, 50–60 × 20–25 µm.

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

A rare, endemic corticolous lichen known from two localities in north-eastern N.S.W.

N.S.W.: S side of Moonee Ck, 12 km NNE of Coffs Harbour, *A.W.Archer P909* (NSW).

*Pertusaria xenismota* is characterised by 8-spored asci and 4,5-dichlorolichexanthone, 2-*O*-methylperlatolic acid and methyl 2-*O*-methylperlatolate in the thallus. Esters of orcinol depsides are uncommon in *Pertusaria*, although the β-orcinol depside ester atranorin is very common in lichens and occurs sporadically in *Pertusaria*. This species is distinguished from the chemically similar *P. praetermissa* by the smaller ascospores and the presence of methyl 2-*O*-methylperlatolate.

***Pertusaria xylophyes*** A.W.Archer, *Mycotaxon* 45: 424 (1992)

T: Mt Fox, 43 km SW of Ingham, Qld, 18°50'S, 145°42'E, 19 June 1986, *J.A.Elix 20366*; holotype: CANB.

Illustration: A.W.Archer, *Biblioth. Lichenol.* 69: 163, fig. 66 (1997).

Thallus dull yellow, thin, occasionally discontinuous, areolate and cracked, subtuberculate. Soredia and isidia absent. Apothecia numerous, verruciform, scattered, rarely confluent, flattened-hemispherical, concolorous with the thallus, not constricted at the base, 0.75–1.50 mm diam. Ostiole conspicuous, pale to dark brown, 0.05–0.20 mm diam., 1 per verruca. Ascospores 8 per ascus, uniseriate, ellipsoidal to subfusiform, smooth, 60–82 × 30–42 µm.

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

An uncommon, endemic corticolous species in eastern Qld and N.S.W.

Qld: Hugh Nelson Ra., 15 km S of Atherton, *J.A.Elix 16400* (CANB); Mount Archer Environmental Park, 7 km NE of Rockhampton, *J.A.Elix 34525* (CANB); Mt Fox, 43 km SW of Ingham, *H.Streimann 37119* (B, CANB, NY). N.S.W.: Telegerry Forest Park, Chichester S.F., 20 km N of Dungog, *H.Streimann 38383 p.p.* (CANB).

The species is characterised by asci with 8 uniseriate ascospores and the presence of thiophanic and 2-*O*-methylperlatolic acids in the thallus. *Pertusaria injuneana* contains perlatolic acid in place of the 2-*O*-methylperlatolic acid of *P. xylophyes*.