GROUP F

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

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Ascospores predominantly uniseriate</td>
<td>2</td>
</tr>
<tr>
<td>1:</td>
<td>Ascospores predominantly biseriate</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Thiophaninic acid absent</td>
<td>3</td>
</tr>
<tr>
<td>2:</td>
<td>Thiophaninic acid present</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Thallus UV+ yellow; lichexanthone present</td>
<td>Pertusaria consanguinea</td>
</tr>
<tr>
<td>3:</td>
<td>Thallus UV+ dull orange; 4,5-dichlorlichexanthone present</td>
<td>Pertusaria lophocarpa</td>
</tr>
<tr>
<td>4</td>
<td>Stictic acid absent</td>
<td>Pertusaria petrophyes</td>
</tr>
<tr>
<td>4:</td>
<td>Stictic acid present</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Thallus dull yellowish green to pale olive-green; northern N.T.</td>
<td>Pertusaria dissita</td>
</tr>
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<td>5:</td>
<td>Thallus dull to bright yellow; eastern Australia</td>
<td>6</td>
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<tr>
<td>6</td>
<td>Thallus isidiate, rarely fertile</td>
<td>Pertusaria xanthodactyla</td>
</tr>
<tr>
<td>6:</td>
<td>Thallus lacking isidia, usually fertile</td>
<td>Pertusaria hypoxantha</td>
</tr>
<tr>
<td>7</td>
<td>Ascospores &lt; 60 µm long</td>
<td>8</td>
</tr>
<tr>
<td>7:</td>
<td>Ascospores &gt; 60 µm long</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Thallus lacking lichen compounds</td>
<td>Pertusaria paratropa</td>
</tr>
<tr>
<td>8:</td>
<td>Thallus containing stictic acid</td>
<td>Pertusaria macra</td>
</tr>
<tr>
<td>9</td>
<td>Thallus UV+ yellow; lichexanthone present</td>
<td>Pertusaria hadrocarpa</td>
</tr>
<tr>
<td>9:</td>
<td>Thallus UV-- or + dull orange; lichexanthone absent</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>Thallus KC--</td>
<td>Pertusaria lavata</td>
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<tr>
<td>10:</td>
<td>Thallus KC+ yellow-orange or orange</td>
<td>11</td>
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<tr>
<td>11</td>
<td>Ascospores hyaline; thiophanic acid present</td>
<td>Pertusaria thula</td>
</tr>
<tr>
<td>11:</td>
<td>Ascospores often blue-grey or brown; arthrothelin present</td>
<td>Pertusaria melanospora</td>
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</tbody>
</table>

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


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

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

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

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

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

T: Mt McLachlan, 7 km NW of Pine Creek, N.T., 13°47'S, 131°47'E, 20 July 1991, J.A.Elix 28213; holo: CANB.
Illustration: J.A.Elix et al., *op. cit.* 277, fig. 1.

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

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

This rare, endemic, saxicolous species is known from two localities in northern N.T. N.T.: Green Ant Ck, 35 km SSE of Adelaide River settlement, J.A.Elix 28191 (CANB).

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


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

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

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

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


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

Thallus dull to bright yellow, areolate and cracked, smooth. Soredia and isidia absent. Apothecia uncommon, verruciform, scattered, rarely confluent, concolorous with the thallus, slightly flattened-hemispherical, becoming constricted at the base, 0.6–1.0 mm diam.
Ostioles inconspicuous, pale to dark yellowish brown, 1 per verruca. Ascospores 8 per ascus, irregularly uniseriate, ellipsoidal, rarely subfusiform, smooth, 55–75 (–90) × 25–37 µm.

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

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

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

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

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


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

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

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


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


Thallus off-white to pale fawn, thin and effuse to thick, becoming cracked and areolate, smooth and dull. Soredia absent; isidia very rare. Apothecia conspicuous, verruciform, sparse and scattered to numerous and crowded, rarely confluent, flattened to irregularly hemispherical, often with concave tops, 1–2 (–3) mm diam. Ostioles conspicuous, black, 1–3 (or 4) per verruca, occasionally sunken. Ascospores (6–) 8 per ascus, uniseriate, ellipsoidal, smooth, 45–75 × 25–40 µm. Pycnidia uncommon, black, immersed, 1–5 per verruca, 0.05–0.15 mm diam. Conidia narrowly fusiform, slightly curved, 5–8 × 1 µm.
Chemistry: Thallus K–, KC–, C–, Pd–, UV+ dull orange; containing 4,5-dichlorolichexanthone (major), 2′-O-methylperlatolic acid (major), confluentic acid (minor); rarely with 2-O-methylperlatolic acid (minor) in place of confluentic acid.

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


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


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

Thallus greyish white, thin, minutely cracked and areolate, smooth and dull, lacking soredia and isidia. Apothecia numerous, conspicuous, verruciform, scattered, flattened-hemispherical, 0.3–0.5 mm diam. Ostiole conspicuous, black, sunken, disc-like, 1 per verruca, 0.2–0.4 mm diam. Ascospores 8 per ascus, irregularly biseriate, ellipsoidal, smooth, 30–36 × 17–20 µm. Chemistry: Thallus K–, KC+ yellow-orange, C+ orange, Pd–; containing stictic acid (minor) and constictic acid (trace).

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


Thallus thick, pale yellow to dull yellow-brown, somewhat granular, minutely cracked and areolate, smooth. Soredia and isidia absent. Apothecia numerous, conspicuous, verruciform, scattered, flattened-hemispherical with constricted bases, concolorous with the thallus, 0.5–1.5 mm diam. Ostiole conspicuous, black, sunken, disc-like, 1 per verruca, 0.2–0.5 mm diam. Ascospores 8 per ascus, irregularly biseriate, ellipsoidal, smooth, colourless or occasionally pale bluish grey or brown, 60–75 × 30–37 µm. Chemistry: Thallus K–, KC+ yellow-orange, C+ orange, Pd–; containing arthothelin (major) and 4,5-dichloronorlichexanthone (minor).

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


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


Thallus greyish white, cracked to areolate, smooth and dull. Soredia and isidia absent. Apothecia numerous, verruciform, scattered, strongly flattened-hemispherical, 0.5–1.0 mm
diam. Ostioles conspicuous, black, pseudolecideine, 1 (–3) per verruca. Ascospores 8 per ascus, irregularly biseriate, ellipsoidal, smooth, 37–55 × 20–30 µm.

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

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


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


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

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

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


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


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

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

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

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

The species is characterised by 8-spored asci and the presence of thiophanic acid. It is distinguished from the somewhat similar *P. hypoxantha* by the absence of thiophaninic acid.
and the arrangement of ascospores in the ascus. *Pertusaria thula* is chemically similar to *P. melanospora*, but that species lacks thiophanic acid and has a more southerly distribution.


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

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

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

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

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

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