**GROUP K**

【Thallus corticolous, fertile; apothecia disciform; asci 1- or 2-spored】

<table>
<thead>
<tr>
<th>1</th>
<th>Ascospores 2 per ascus; K+ yellow then red; norstictic acid present</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:</td>
<td>Ascospores 1 per ascus; norstictic acid present or absent</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Ascospores &lt; 100 µm long</td>
<td>P. amnicola</td>
</tr>
<tr>
<td>2:</td>
<td>Ascospores ≥ 120 µm long</td>
<td>P. asiana</td>
</tr>
<tr>
<td>3</td>
<td>Thallus Pd+ yellow or orange</td>
<td>4</td>
</tr>
<tr>
<td>3:</td>
<td>Thallus Pd—</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Thallus K—, Pd+ orange-red, containing protocetraric acid</td>
<td>P. lacericans</td>
</tr>
<tr>
<td>4:</td>
<td>Thallus K+ red or yellow</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Thallus K+ yellow then red, Pd+ yellow; norstictic acid present</td>
<td>P. sublacerans</td>
</tr>
<tr>
<td>6</td>
<td>Discs adnate on the thallus; haemathomnic acid present</td>
<td>P. commutata</td>
</tr>
<tr>
<td>6:</td>
<td>Discs on verruciform swellings; thamnolic acid present</td>
<td>P. miscella</td>
</tr>
<tr>
<td>7</td>
<td>Thallus K+ violet; hypothamnolic acid present</td>
<td>P. novaezelandiae</td>
</tr>
<tr>
<td>7:</td>
<td>Thallus K—; hypothamnolic acid absent</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Thallus KC+ orange-red; lecanoric acid present</td>
<td>P. velata</td>
</tr>
<tr>
<td>8:</td>
<td>Thallus KC+ violet; picrolichenic acid present</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>Discs 1–3 mm diam., conspicuously concave; atranorin present</td>
<td>P. patellifera</td>
</tr>
<tr>
<td>9:</td>
<td>Discs 0.5–1.5 mm diam., plane; lichehexanthone present</td>
<td>P. clarkeana</td>
</tr>
</tbody>
</table>


*T:* track to Mt Gower, Lord Howe Island, 31°34'42"S, 159°04'43"S, alt. 185 m, on bark, 11 Feb. 1985, *H.Streimann 56033;* holo: CANB.


Thallus pale greenish white, smooth, slightly cracked, lacking isidia and soredia. Apothecia disciform, numerous, scattered, slightly immersed or adnate on the thallus, 0.5–0.8 mm diam.; disc black, white-pruinose; disc margin occasionally inrolled and torn. Ascospores 2 per ascus, ellipsoidal, thin-walled, (70–) 80–98 × (21–) 25–35 µm; ascospore wall 3–4 µm thick.

Chemistry: Thallus K+ weak red, KC—, C—, Pd+ weak yellow; containing norstictic acid in low concentration.

A rare endemic corticolous species is known only from Lord Howe Island.


The lichen is characterised by disciform apothecia, bisporous asci and the presence of norstictic acid. The ascospores are smaller than those in the broadly similar *P. asiana* (q.v.).

**Pertusaria asiana** Vain., *Suomal. Elain-ja Kasvit. Seuran Vanamon Julk.* 1(3): 44 (1921)


Thallus pale olive-green, smooth, dull and cracked. Isidia absent. Apothecia numerous, conspicuous, disciform, sorediate, 0.8–1.3 mm diam. Ascospores 2 per ascus, ellipsoidal, 120–145 × 40–50 μm; wall 4–5 μm thick.

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

This rare, corticolous species is known only from one locality in north-eastern Qld. Also in Thailand and the Philippines.

Qld: Paluma–Hidden Valley road, 41 km SSW of Ingham, H.Streimann 57784 (CANB).

Characterised by 2-spored asci and the presence of norstictic acid in the thallus. While its morphology resembles that of *P. novaezelandiae*, the latter has a very different chemistry.


Thallus off-white to pale yellowish white, wrinkled and cracked. Soredia and isidia absent. Apothecia numerous and crowded, disciform, adnate or rarely slightly stipitate, 0.5–1.5 mm diam.; disc rounded, somewhat sunken, plane, white-pruinose; margin concolorous with the thallus. Asci clavate, rarely fertile. Ascospores 1 per ascus, sublachrymoid to elongate-ellipsoidal, smooth, (100–)135–150 (–175) × 30–55 μm; ascospore wall c. 1 μm thick.

**Chemistry**: Thallus K−, KC+ violet, C−, Pd−; containing lichexanthone (minor to major), with picrolichenic acid (minor) and subpicrolichenic acid (minor), or rarely with picrolichenic acid (minor), superpicrolichenic acid (minor) and hyperpicrolichenic acid (minor).

An endemic, corticolous species in eastern Australia (Qld and N.S.W.); mainly in mangroves (*Avicennia*, *Bruguiera* and *Rhizophora*), but also on *Acacia*, *Argyroderon* and *Casuarina*.

Qld: Lake Barrine Natl Park, J.A.Elix 2639 (CANB); Noosa R., N of Tewantin, J.Hafellner 19229 (GZU); Hinchinbrook Is., G.N.Stevens 3925 (BRI). N.S.W.: 3 km SW of Evans R., Bundjalung Natl Park, A.W.Archer P383 (NSW); Buckenburra R. estuary, W of Batemans Bay, J.A.Elix 21864 (CANB).

**Pertusaria clarkeana** is characterised by the sterile or 1-spored asci and the presence of lichexanthone and picrolichenic acid in the thallus. It resembles *P. velata* and *P. commutata*, but it is chemically distinct from those species.

A possible earlier name for this species is *P. velatoides* A.L.Sm. (1922), from New Caledonia. However, the type material of that taxon was not available for examination.

**Pertusaria commutata** Müll.Arg., *Flora* 67: 269 (1884)

T: Caracas, Venezuela, Dr Ernst s.n.; lecto: G, fide A.W.Archer, Mycotaxon 41: 253 (1991); isolecto: US.


Thallus off-white to pale grey, folded and cracked, smooth and dull. Soredia and isidia absent. Apothecia numerous and crowded, disciform, adnate, 0.4–0.8 mm diam.; disc coarsely white-pruinose. Ascospores 1 per ascus, ellipsoidal, smooth, single-walled, 100–135 (–150) × 35–50 μm.

**Chemistry**: Thallus K+ yellow, KC−, C−, Pd+ yellow; containing haemathamnolic acid (major), lichexanthone (variable), thamnolic acid (trace) and baeomycesic acid (trace).

A tropical to subtropical, corticolous species that is known from eastern Qld and N.S.W.; also in Brazil, Venezuela, south-eastern U.S.A. and China.

Qld: Chester R., E of Millwraith Ra., G.Butler 429 (CANB); Mt Farrenden, 26 km SSW of Charters Towers, J.A.Elix 20588 (CANB); Three-Mile Ck, 5 km N of Townsville, J.A.Elix 20042 (CANB). N.S.W.: Toombar S.F., A.W.Archer P454 (NSW); Evans R., A.W.Archer P389 (NSW).
The species is characterised by asci with a single ascospore and the presence of haemathamnolic acid in the thallus. It resembles \textit{P. velata}, but it is distinguished from that species by its chemistry.

Reports of \textit{P. commutata} from Tas. are probably based on misidentifications of \textit{P. novaezelandiae}, a common species in Tasmanian rainforest.


\textit{T}: Cattle Creek State Forest, Briggsvale, 12 km NNE of Dorrigo, N.S.W., 13 Oct. 1978, \textit{D.Verdon 3843}; holo: CANB.


Thallus olive-green, somewhat areolate and cracked, smooth and glossy. Soredia and isidia absent. Pustules 0.2–1.0 mm diam., opening at the top to reveal the white medulla. Apothecia inconspicuous, disciform, immersed in larger pustules. Ascospores uncommon, 1 per ascus, elongate-ellipsoidal, smooth, 170–180 × 35–40 µm; ascospore wall c. 1 µm thick.

\textit{Chemistry}: Thallus K–, KC–, C–, Pd+ orange; containing protocetraric acid (major).

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

Qld: Bunya Mtns, c. 56 km NE of Dalby, \textit{H.Hafellner 16744}, 18928 (GZU). N.S.W.: Mt Banda Banda, 44 km NW of Wauchope, \textit{D.Verdon 4049} (CANB); Wilson R., Mount Boss S.F., c. 37 km NW of Wauchope, \textit{A.W.Archer P615} (NSW); Dorrigo Natl Park, 38 km WSW of Coffs Harbour, \textit{A.W.Archer P868} (NSW).


\textit{T}: Clarke Ra., 46 km S of Proserpine, Qld, 20°50'S, 148°32'E, 29 June 1986, \textit{J.A.Elix 20942}; holo: CANB.


Thallus off-white to very pale grey, thin, slightly wrinkled and cracked, smooth and glossy, lacking soredia and isidia. Apothecia conspicuous, disciform, scattered, the discs clustered on flattened verruciform swellings, subhemispherical or irregular in outline, concolorous with the thallus, 1–3 mm wide; disc white, plane or concave, sunken, 0.3–0.5 mm diam., epruinose; margin inrolled. Ascospores 1 per ascus, ellipsoidal, smooth, 100–130 × 30–40 (–50) µm; wall c. 1 µm thick.

\textit{Chemistry}: Thallus K+, KC–, C–, Pd+ yellow; containing lichexanthone (major) and thamnolic acid (major).

An endemic, corticolous species known from two localities in north-eastern Qld.

Qld: Bambo Ra., 79 km SSE of Coen, \textit{H.Streimann 56689} (CANB).

The species is characterised by disciform apothecia on verruciform swellings, monosporous asci and the presence of lichexanthone and thamnolic acid in the thallus.

\textbf{Pertusaria novaezelandiae} Szatala, \textit{Borbásia} 1: 60 (1939)

\textit{T}: L. Waikare-Moana, New Zealand, 1932, \textit{J.Jablonszky}; holo: \textit{BP T298, n.v.}


Thallus off-white to pale greyish white, thick, wrinkled and cracked, smooth and dull. Soredia and isidia absent. Apothecia disciform, 0.5–1.5 mm diam.; disc white-pruinose when fertile, occasionally sorediate. Ascospores 1 per ascus, ellipsoidal, (120–) 140–170 × 30–55 µm.

\textit{Chemistry}: Thallus K+ violet, KC+ reddish violet, C–, Pd–, UV–; containing hypothamnolic acid (major) and ±conhypothamnolic acid (minor).
This corticolous species occurs mainly in Nothofagus-dominated rainforest in south-eastern Qld and in N.S.W., Vic. and Tas.; also in New Zealand.


This species is characterised by monosporous asci and the presence of hypothamnolic acid which is responsible for the K+ reddish violet reaction. It can be distinguished from P. tropica by the absence of lichexanthone and the more southerly distribution.


T: 8 km E of Mt Mowbullan, Bunya Mtns, Qld, 15 Aug. 1985, R.W.Rogers 8975; holo: BRI.

Illustration: A.W.Archer, *op. cit.* 243, fig. 7.

Thallus pale olive-green, wrinkled and cracked. Soredia and isidia absent. Apothecia numerous and scattered, conspicuously dish-shaped, occasionally dividing into 2 or 3 smaller ‘dishes’, concolorous with the thallus, 1–3 mm diam.; disc concave, white-pruinose. Ascospores 1 per ascus, broadly ellipsoidal, smooth, thin-walled, 150–170 × 45–55 µm.

**Chemistry:** Thallus K–, KC+ violet, C–, Pd–; containing atranorin (major), picrolichenic acid (major), superpicrolichenic acid (trace) and megapicrolichenic acid (trace).

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

**Pertusaria patellifera** is characterised by the dish-shaped apothecia, monosporous asci and the presence of atranorin and picrolichenic acid in the thallus. It is distinguished from the chemically similar *P. clarkeana* by the shape of the apothecia, larger ascospores and, to a lesser extent, by the chemistry (*P. clarkeana* lacks atranorin).


T: summit of Intermediate Hill, Lord Howe Island, [31°33'S, 159°06'E], July 1911, W.W.Watts s.n.; holo: NSW L5219.


Thallus olive-green, thin, somewhat areolate and cracked, glossy, lacking soredia and isidia. Pustules numerous, subisidioid, finally hemispherical to subspherical, 0.5–1.5 mm diam., the upper part opening to reveal the white medulla. Apothecia disciform, somewhat sunken; disc 0.5–1.0 mm diam., white-pruinose. Ascospores uncommon, 1 per ascus, ellipsoidal, 150–175 × 60–70 µm; wall smooth, c. 1 µm thick.

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

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


**Pertusaria sublacerans** is characterised by the olive-green, pustulate thallus containing norstictic acid. It is distinguished from the morphologically similar *P. lacerans* and *P. lacericans* (q.v.) which contain picrolichenic acid and protocetraric acid, respectively.


Thallus greyish white to off-white, thick, slightly cracked and areolate, smooth to slightly wrinkled, dull. Soredia and isidia absent. Apothecia numerous, crowded, disciform, immature apothecia irregularly hemispherical or subspherical, constricted at the base, 0.5–1.0 mm diam., mature apothecia becoming flattened and exposing the pale to dark reddish orange discs, 0.5–0.8 mm diam., slightly to densely white-pruinose. Ascospores 1 per ascus, ellipsoidal, thin-walled, smooth, 110–155 (–175) × 30–45 (–50) µm.

Chemistry: Thallus K–, KC+ orange-red, C+ red, Pd–; containing lecanoric acid (major), gyrophoric acid (trace), orsellinic acid (trace) and ±lichexanthone (trace to major).

Corticicolous and common in northern and eastern Australia (N.T., Qld and N.S.W.); a tropical to temperate species in both hemispheres, including Norfolk Is., New Zealand, Fiji, Vanuatu, New Caledonia and Papua New Guinea.


The species is characterised by monosporous asci and the presence of lecanoric acid which gives the thallus a C+ red reaction.