

## PERTUSARIA

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*Pertusaria* DC., in J.B.A.P. de M. de Lamarck & A.P. de Candolle, *Fl. Franç.*, 3rd edn, 2: 319 (1805), *nom. cons.*; from the Latin *pertusus* (perforated), in reference to the ostioles of the ascomatal verrucae.

Type: *Pertusaria communis* DC., *nom. illeg.* (*Lichen verrucosus* Huds.) [= *P. pertusa* (L.) Tuck.]

Thallus crustose, white, yellow, grey, green or of intermediate shades; surface smooth, continuous or cracked, with or without soredia or isidia. Apothecia innate within convex, hemispherical or subglobose verrucae that are solitary or confluent, or apothecia disciform; disc small or broad and lecanorine. Asci clavate or cylindrical, 1–8-spored. Ascospores oval, ellipsoidal, fusiform or, rarely, globose, unicellular, hyaline, c. 20–250 µm long, with single or double ascospore wall; inner ascospore wall smooth or rough. Pycnidia (rare in Australian species) black, immersed. Conidia narrowly fusiform to bacilliform, straight or slightly curved.

A genus of c. 500 species that is widely distributed in both hemispheres, from Subarctic to tropical areas. In Australia most species grow on bark and rock in areas with more than c. 500 mm annual rainfall. A total of 119 species and four additional varieties are known from Australia; 52 species and three varieties are endemic.

A detailed account of the typification of the genus was provided by Dibben (1980).

M.J.Dibben, The chemosystematics of the lichen genus *Pertusaria* in North America north of Mexico, *Milwaukee Publ. Biol. Geol.* 5: 1–162 (1980); G.Kantvilas, The genus *Pertusaria* in Tasmanian rainforests, *Lichenologist* 22: 289–300 (1990); A.W.Archer, New species and new reports of *Pertusaria* (lichenised Ascomycotina) from Australia and New Zealand with a key to the species in Australia, *Mycotaxon* 41: 223–269 (1991); A.W.Archer, Synonymy and chemotaxonomy of Australian *Pertusaria* species (Lichenes) based on Australian type specimens, *Telopea* 4: 165–185 (1991); A.W.Archer, Additional new species and new reports of *Pertusaria* (lichenised Ascomycotina) from Australia, *Mycotaxon* 44: 13–20 (1992); A.W.Archer & J.A.Elix, Further new species and new reports of *Pertusaria* (lichenised Ascomycotina) from Australia, *Mycotaxon* 45: 417–431 (1992); A.W.Archer, A chemical and morphological arrangement of the lichen genus *Pertusaria*, *Biblioth. Lichenol.* 53: 1–17 (1993); A.W.Archer & J.A.Elix, Saxicolous species of *Pertusaria* (Lichenes) common to Australia and New Zealand, *New Zealand J. Bot.* 31: 111–116 (1993); J.A.Elix, W.M.Malcolm & A.W.Archer, New species of *Pertusaria* (lichenised Ascomycotina) from New Zealand, Australia and Venezuela, *Mycotaxon* 53: 273–281 (1995); A.W.Archer, The lichen genus *Pertusaria* in Australia, *Biblioth. Lichenol.* 69: 1–249 (1997); J.A.Elix, A.Aptroot, A.W.Archer, The lichen genus *Pertusaria* (lichenised Ascomycotina) in Papua New Guinea and Australia: twelve new species and thirteen new reports, *Mycotaxon* 64: 17–35 (1997); H.T.Lumbsch & I.Schmitt, Molecular data suggest that the lichen genus *Pertusaria* is not monophyletic, *Lichenologist* 33: 161–170 (2001).

### SYNOPTIC KEY TO SPECIES GROUPS

- 1 Apothecia verruciform; ascospores with a double wall, sometimes with a rough inner wall; C<sub>3</sub>–C<sub>7</sub> orcinol depsides often present [subg. *Pertusaria*].....2
- 1: Apothecia disciform; ascospores with a single smooth wall; chloroxanthones absent; C<sub>1</sub> orcinol depsides, C<sub>3</sub>–C<sub>7</sub> depsones or β-orcinol depsidones present [subg. *Monomurata*].....8

2	Thallus corticolous (1).....	3
2:	Thallus saxicolous.....	6
3	Thallus sorediate or isidiate, lacking apothecia (2).....	<b>Group A</b>
3:	Thallus with apothecia, lacking soredia and isidia.....	4
4	Ascospores 8 per ascus (3:).....	<b>Group B</b>
4:	Ascospores 2–4 per ascus.....	5
5	Ascospores (3–) 4 per ascus (4:).....	<b>Group C</b>
5:	Ascospores 2 per ascus.....	<b>Group D</b>
6	Thallus sorediate or isidiate, lacking apothecia (2:).....	<b>Group E</b>
6:	Thallus with apothecia, lacking soredia and isidia.....	7
7	Ascospores 8 per ascus (6:).....	<b>Group F</b>
7:	Ascospores 2 or 4 per ascus.....	<b>Group G</b>
8	Thallus isidiate, usually with terminal apothecia; asci usually with 1 or 2 ascospores; lichexanthone and depsones absent [subg. <i>Monomurata</i> sect. <i>Digitatae</i> ] (1:).....	<b>Group H</b>
8:	Thallus sorediate or with disciform apothecia; asci with 1, 2 or 8 ascospores; lichexanthone and depsones or $\beta$ -orcinol <i>m</i> -depsides often present [subg. <i>Monomurata</i> sect. <i>Monomuratae</i> ].....	9
9	Thallus corticolous (8:).....	10
9:	Thallus saxicolous.....	13
10	Thallus lacking fertile apothecia, sorediate, isidiate or pustulate, or with sterile apothecia (9).....	11
10:	Thallus with fertile apothecia, with or without soredia.....	12
11	Thallus sorediate or isidiate (10).....	<b>Group I</b>
11:	Thallus pustulate or with sterile apothecia, lacking soredia and isidia.....	<b>Group J</b>
12	Ascospores 1 or 2 per ascus (10:).....	<b>Group K</b>
12:	Ascospores 8 per ascus.....	<b>Group L</b>
13	Thallus sterile, sorediate or isidiate (9:).....	<b>Group M</b>
13:	Thallus fertile, lacking soredia and isidia.....	<b>21. P. erubescens</b>

## Group A

[Thallus corticolous, sterile, sorediate or isidiate]

1	Thallus sorediate.....	2
1:	Thallus isidiate.....	3
2	Soralia bright yellow, KC+ orange; thiophaninic acid present (1).....	<b>52. P. maritima</b>
2:	Soralia white to off-white, KC–; thiophaninic acid absent.....	<b>82. P. puffina</b>
3	Thallus Pd+ orange; protocetraric acid present (1:).....	<b>109. P. umbricola</b>
3:	Thallus Pd–; protocetraric acid absent.....	4
4	Thallus yellow, KC+ orange; thiophaninic acid present (3:).....	<b>24. P. flavoisidiata</b>
4:	Thallus pale olive-green, pale fawn or yellowish white, KC–; thiophaninic acid absent.....	5
5	Thallus UV+ yellow, containing lichexanthone (4:).....	<b>37. P. isidiosia</b>
5:	Thallus UV– or UV+ dull orange, not containing lichexanthone.....	6
6	Thallus containing perlatolic and confluent acids (5:).....	<b>13. P. coniophora</b>
6:	Thallus not containing perlatolic and confluent acids.....	7
7	Thallus containing 4,5-dichlorolichexanthone and 2- <i>O</i> -methylperlatolic acid; stictic acid absent (6:).....	<b>26. P. georgeana</b>
7:	Thallus containing stictic acid.....	8
8	Thallus lacking lichexanthenes (7:).....	<b>61. P. muricata</b>
8:	Thallus containing chlorolichexanthenes.....	9
9	Thallus containing di- and tri-chlorolichexanthenes (8:).....	<b>93. P. subsidiosa</b>
9:	Thallus containing 4,5-dichlorolichexanthone.....	10

10	Thallus containing skyrin (9:)	60. <i>P. montpittensis</i>
10:	Thallus containing 2'- <i>O</i> -methylperlatolic acid	74. <i>P. pilosula</i>

## Group B

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

1	Ascospores predominantly uniseriate in the ascus	2
1:	Ascospores predominantly biseriate in the ascus	22
2	Thallus K+ yellow → red; norstictic acid present (1)	63. <i>P. norstictica</i>
2:	Thallus K- or K+yellow; norstictic acid absent	3
3	Thallus KC+ orange; thiophanic acid present (2:)	4
3:	Thallus KC-; thiophanic acid absent	7
4	Verrucae C+ violet; 4- <i>O</i> -methylisocryptochlorophaeic and stictic acids present (3)	68. <i>P. paradoxa</i>
4:	Verrucae C-	5
5	Stictic acid present (4:)	44. <i>P. leioplacella</i>
5:	Stictic acid absent (but see 28. <i>P. gundermanica</i> )	6
6	2- <i>O</i> -Methylperlatolic acid present (5:)	119. <i>P. xylophyes</i>
6:	Perlatolic acid present	35. <i>P. injuneana</i>
7	Thallus UV+ yellow; lichexanthone present (3:)	8
7:	Thallus UV- or UV+ orange; lichexanthone absent	9
8	Ascospores 75–105 µm long; 2- <i>O</i> -methylperlatolic acid present (7)	46. <i>P. leucostigma</i>
8:	Ascospores 50–67 µm long; 2,2-di- <i>O</i> -methylstenosporic and stictic acids present	112. <i>P. verruculifera</i>
9	Chlorolichexanthenes absent (7:)	10
9:	Chlorolichexanthenes present	11
10	Lichen compounds absent (9)	96. <i>P. subrigida</i>
10:	2- <i>O</i> -Methylperlatolic acid present	53. <i>P. mattogrossensis</i>
11	2-Chlorolichexanthone present (9:)	12
11:	Di- and/or trichlorolichexanthenes present	13
12	Ascospores 60–70 µm long; 2'- <i>O</i> -methylstenosporic acid present (11)	7. <i>P. boweniana</i>
12:	Ascospores 70–92 µm long; divaricatic acid present	66. <i>P. orarensis</i>
13	Di- and trichlorolichexanthenes present (11:)	14
13:	4,5-Dichlorolichexanthone present	15
14	Stictic acid present (13)	28. <i>P. gundermanica</i>
14:	Stictic acid absent	12. <i>P. complanata</i>
15	Ascospores 32–70 µm long (13:)	16
15:	Ascospores more than 70 µm long	18
16	Ostioles pale brown to black, 1–4 per verruca (15)	27. <i>P. gibberosa</i>
16:	Ostioles white to pale grey, usually 1 per verruca	17
17	Apothecial verrucae 0.8–1.2 mm diam.; thallus containing 2- <i>O</i> -methylperlatolic acid (16:)	118. <i>P. xenismota</i>
17:	Apothecial verrucae 0.8–1.2 mm diam.; thallus containing 2- <i>O</i> -methylperlatolic acid	47. <i>P. leucostomoides</i>
18	2'- <i>O</i> -Methylstenosporic acid present (15:)	77. <i>P. praetermissa</i>
18:	2'- <i>O</i> -Methylstenosporic acid absent	19
19	Ostioles at least slightly mammiform (18:)	20
19:	Ostioles not mammiform	21

20	2'- <i>O</i> -Methylperlatolic acid present (19)	69. <i>P. paragibberosa</i>
20:	Miriquidic acid present	64. <i>P. novaehollandiae</i>
21	Planaic acid present (19)	75. <i>P. planaica</i>
21:	2,2'-di- <i>O</i> -Methylstenosporic acid present	95. <i>P. subplanaica</i>
22	Thallus K+ yellow → red, containing norstictic acid (1)	110. <i>P. undulata</i>
22:	Thallus K-, not containing norstictic acid	23
23	Thallus Pd+ orange-red; protocetraric acid present; ascospores 70–95 μm long (22)	20. <i>P. errinundrensis</i>
23:	Thallus Pd-, protocetraric acid absent	24
24	Thallus sorediate; soralia yellow; thiophaninic and stictic acids present (23)	117. <i>P. xanthosorediata</i>
24:	Thallus esorediate	25
25	Thallus UV+ yellow; lichexanthone and stictic acid present (24)	26
25:	Thallus UV+ orange or UV-, lichexanthone absent	27
26	2,2'-di- <i>O</i> -Methylstenosporic acid present (25)	2. <i>P. alboaspera</i>
26:	2,2'-di- <i>O</i> -Methylstenosporic acid absent	15. <i>P. dehiscens</i>
27	4,5-Dichlorolichexanthone present (25)	28
27:	4,5-Dichlorolichexanthone absent	30
28	Divaricatic acid present (27)	80. <i>P. pseudothwaitesii</i>
28:	Divaricatic acid absent	29
29	Stictic acid present (28)	43. <i>P. leiocarpella</i>
29:	Stictic acid absent	86. <i>P. rigida</i>
30	Thallus KC+ yellow-orange (27)	31
30:	Thallus KC-	32
31	Thiophaninic acid present (30)	100. <i>P. thiophaninica</i>
31:	Arthothelin and 6- <i>O</i> -methylarthothelin present	33. <i>P. howeana</i>
32	Chlorolichexanthenes present (30)	49. <i>P. limbata</i>
32:	Chlorolichexanthenes absent	33
33	2- <i>O</i> -Methylstenosporic acid present (32)	45. <i>P. leucoplaca</i>
33:	Divaricatic and stictic acids present	98. <i>P. sydneyensis</i>

### Group C

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

1	Ascospores with a rough inner wall	2
1:	Ascospores with a smooth inner wall	7
2	Thallus isidiate (1)	93. <i>P. subsidiosa</i>
2:	Thallus lacking isidia	3
3	Ostioles inconspicuous, pale (2)	4
3:	Ostioles conspicuous, black	6
4	Stictic acid present (3)	67. <i>P. pallida</i>
4:	Stictic acid absent	5
5	Lichexanthone present (4)	91. <i>P. subcerrusata</i>
5:	4,5-Dichlorolichexanthone and planaic acid present	48. <i>P. leucothelia</i>
6	4,5-Dichlorolichexanthone present (3)	57. <i>P. microstoma</i>
6:	Chlorolichexanthenes present	18. <i>P. elliptica</i>
7	Ostioles usually pale (1)	32. <i>P. hermaka</i>
7:	Ostioles black	8

8	Thiophaninic acid present (7:)	9
8:	Thiophaninic acid absent	11
9	Stictic acid absent (8)	106. <b>P. trimera</b>
9:	Stictic acid present	10
10	Ascospores 75–87 µm long; 4- <i>O</i> -methylisocryptochlorophaeic acid absent (9:)	1. <b>P. aberrans</b>
10:	Ascospores 95–145 µm long; 4- <i>O</i> -methylisocryptochlorophaeic acid present	68. <b>P. paradoxa</b>
11	Di- and trichlorolichexanthonones present (8:)	12
11:	2-Chlorolichexanthonone or planaic acid present	14
12	Stictic acid absent; 2- <i>O</i> -methylperlatolic acid present (11)	3. <b>P. aquilonia</b>
12:	Stictic acid present	13
13	Ascospores 64–75 µm long; confluent acid present (12:)	23. <b>P. ewersii</b>
13:	Ascospores 75–135 µm long; confluent acid absent	8. <b>P. ceylonica</b>
14	Stictic acid absent (11:)	15
14:	Stictic acid present	16
15	Thallus off-white, containing planaic acid; verrucae 1.0–1.5 mm diam. (14)	17. <b>P. doradorensis</b>
15:	Thallus pale olive-green, not containing planaic acid; verrucae 0.4–1.0 mm diam.	59. <b>P. modesta</b>
16	Lichexanthonone present (14:)	5. <b>P. atromaculata</b>
16:	Lichexanthonone absent; 2- <i>O</i> -methylhyperlatolic and 2- <i>O</i> -methylsuperlatolic acids present	25. <b>P. follmanniana</b>

## Group D

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

1	Ascospores with a rough inner wall	2
1:	Ascospores with a smooth inner wall	5
2	Thallus Pd+ orange; protocetraric acid present (1)	103. <b>P. thwaitesii</b>
2:	Thallus Pd–; protocetraric acid absent	3
3	Stictic acid present with di- and tri-dichlorolichexanthonones (2:)	9. <b>P. cicatricosa</b>
3:	Stictic acid absent	4
4	4,5-Dichlorolichexanthonone and 2'- <i>O</i> -methylperlatolic acid present (3:)	104. <b>P. trachyspora</b>
4:	Di- and trichlorolichexanthonones, 2- <i>O</i> -methyl- and 2'- <i>O</i> -methylperlatolic acids present	18. <b>P. elliptica</b>
5	Thallus K+ yellow → red, Pd+ yellow, containing norstictic acid (1:)	31. <b>P. hartmannii</b>
5:	Thallus K–, lacking norstictic acid	6
6	KC+ orange; thiophaninic or thiophanic acids present (5:)	7
6:	KC–; thiophaninic and thiophanic acids absent	9
7	Thiophanic acid present (6)	88. <b>P. saltuensis</b>
7:	Thiophaninic and stictic acids present	8
8	Ascospores 80–110 (–120) µm long, ellipsoidal (7:)	101. <b>P. thiospoda</b>
8:	Ascospores 125–150 (–180) µm long, fusiform	19. <b>P. epacrospora</b>
9	Thallus and verrucae isidiate (6:)	37. <b>P. isidiosa</b>
9:	Thallus and verrucae not isidiate	10
10	Stictic acid absent (9:)	11
10:	Stictic acid present	15
11	Thallus lacking lichen compounds (10)	55. <b>P. melaleucoides</b>
11:	Thallus with chlorolichexanthonones	12
12	Thallus with di- and trichlorolichexanthonones (11:)	115. <b>P. xanthonaria</b>
12:	Thallus with 4,5-dichlorolichexanthonone	13

13	Thallus with 4,5-dichlorolichexanthone alone (12:)	36. <i>P. irregularis</i>
13:	Thallus with 4,5-dichlorolichexanthone and orcinol <i>p</i> -depsides	14
14	2'- <i>O</i> -Methylperlatolic acid present (13:)	84. <i>P. pycnothelia</i>
14:	2'- <i>O</i> -Methylperlatolic acid present	54. <i>P. meeana</i>
15	Thallus lacking chloroxanthenes, with or without lichexanthone (10:)	76. <i>P. porinella</i>
15:	Thallus with chloroxanthenes	16
16	Ostioles inconspicuous, 1–5 per verruca, pale to dark brown (15:)	72. <i>P. pertusella</i>
16:	Ostioles conspicuous, 1 (or 2) per verruca, black	17
17	Thallus containing 2-chloro-6- <i>O</i> -methylnorlichexanthone (16:)	83. <i>P. pustulata</i>
17:	Thallus not containing 2-chloro-6- <i>O</i> -methylnorlichexanthone	78. <i>P. pseudococcodes</i>

## Group E

[Thallus saxicolous, sorediate or isidiate, sterile]

1	Thallus isidiate; stictic acid present	2
1:	Thallus sorediate	3
2	4,5-Dichlorolichexanthone present (1)	60. <i>P. montpittensis</i>
2:	Thiophaninic acid present	114. <i>P. xanthodactylina</i>
3	Thiophaninic acid absent (1:)	4
3:	Thiophaninic acid present	5
4	Chlorolichexanthenes and stictic acid present (3)	82. <i>P. puffina</i>
4:	Perlatolic acid homologues present	87. <i>P. salebrosa</i>
5	Thallus C+ orange, with stictic and constictic acids; eastern Australia (3:)	116. <i>P. xanthoplaca</i>
5:	Thallus C–, with stictic and hypostictic acids; tropical W.A. and N.T.	85. <i>P. remota</i>

## Group F

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

1	Ascospores predominantly uniseriate	2
1:	Ascospores predominantly biseriata	7
2	Thiophaninic acid absent (1)	3
2:	Thiophaninic acid present	4
3	Thallus UV+ yellow; lichexanthone present (2)	14. <i>P. consanguinea</i>
3:	Thallus UV+ dull orange; 4,5-dichlorolichexanthone present	50. <i>P. lophocarpa</i>
4	Stictic acid absent (2:)	73. <i>P. petrophyes</i>
4:	Stictic acid present	5
5	Thallus dull yellowish green to pale olive-green; northern N.T. (4:)	16. <i>P. dissita</i>
5:	Thallus yellow; eastern Australia	6
6	Thallus isidiate, rarely fertile (5:)	114. <i>P. xanthodactylina</i>
6:	Thallus lacking isidia, usually fertile	34. <i>P. hypoxantha</i>
7	Most or all ascospores less than 50 µm long (1:)	8
7:	Ascospores more than 60 µm long	9
8	Thallus lacking lichen compounds (7)	70. <i>P. paratropa</i>
8:	Thallus containing stictic acid	51. <i>P. macra</i>
9	Thallus UV+ yellow; lichexanthone present (7:)	30. <i>P. hadrocarpa</i>
9:	Thallus UV– or UV+ dull orange; lichexanthone absent	10
10	Ascospores 85–105 µm long; thallus KC– (9:)	42. <i>P. lavata</i>
10:	Ascospores 60–80 µm long; thallus KC+ orange	11

- 11 Ascospores always hyaline; thallus containing thiophanic acid (*I*:) ..... 102. *P. thula*  
 11: Ascospores sometimes blue-grey or brown; thallus containing arthothelin ..... 56. *P. melanospora*

### Group G

[Thallus saxicolous; apothecia verruciform; asci 2- or 4-spored]

- 1 Asci 4-spored; inner ascospore wall smooth; ascospores 80–105 µm long ..... 105. *P. trevethensis*  
 1: Asci 2-spored; inner ascospore wall smooth or rough; ascospores 140–200 µm long ..... 2  
 2 Inner ascospore wall smooth; thallus K+ weak yellow; stictic acid present (*I*:) ..... 113. *P. vulpina*  
 2: Inner ascospore wall rough; thallus K+ yellow → red; norstictic acid present ..... 39. *P. knightiana*

### Group H

[Thallus isidiate, usually with terminal apothecia; asci usually 1- or 2-spored]

- 1 Thallus corticolous or muscicolous, containing protocetraric acid ..... 29. *P. gymnospora*  
 1: Thallus saxicolous, not containing protocetraric acid ..... 2  
 2 Thallus P–, K+ violet; hypothamnolic acid present (*I*:) ..... 92. *P. subdactylina*  
 2: Thallus Pd+ orange, K+ yellow → red; salazinic acid present ..... 79. *P. pseudodactylina*

### Group I

[Thallus corticolous, sterile, sorediate (soralia white) or isidiate]

- 1 Thallus isidiate ..... 6. *P. barbatica*  
 1: Thallus sorediate ..... 2  
 2 Soralia K– (*I*:) ..... 81. *P. psoromica*  
 2: Soralia K+ yellow, red or purple ..... 3  
 3 Soralia K+ wine-red or reddish violet, Pd–; hypothamnolic acid present (2:) ..... 4  
 3: Soralia K+ yellow or red ..... 5  
 4 Soralia UV+ yellow; lichexanthone present (3) ..... 107. *P. tropica*  
 4: Soralia UV–; lichexanthone absent ..... 65. *P. novaezelandiae*  
 5 Soralia K+ yellow → red; norstictic acid present (3:) ..... 22. *P. erythrella*  
 5: Soralia K+ yellow; thamnolic acid present ..... 89. *P. scaberula*

### Group J

[Thallus corticolous, pustulate or with sterile apothecial discs]

- 1 Thallus pustulate, usually with the medulla exposed within the pustules ..... 2  
 1: Thallus with sterile apothecial discs ..... 4  
 2 Thallus Pd–, KC+ violet, containing picrolichenic acid (*I*) ..... 40. *P. lacerans*  
 2: Thallus Pd+ yellow or orange, KC– ..... 3  
 3 Thallus K+ yellow → red, Pd+ yellow, containing norstictic acid (2:) ..... 94. *P. sublacerans*  
 3: Thallus K–, Pd+ orange, containing protocetraric acid ..... 41. *P. lacericans*  
 4 Apothecial disc K+ yellow or violet (*I*:) ..... 5  
 4: Apothecial disc K–, KC+ violet or orange-red ..... 8  
 5 Apothecial disc K+ violet, Pd–; hypothamnolic acid present (4) ..... 65. *P. novaezelandiae*  
 5: Apothecial disc K+ yellow, Pd+ yellow ..... 6

6	Apothecial disc UV-; lichexanthone absent; thamnolic acid present (5:)	99. <i>P. thamnolica</i>
6:	Apothecial disc yellow; lichexanthone present	7
7	Thallus containing thamnolic acid (6:)	58. <i>P. miscella</i>
7:	Thallus containing haemathamnolic acid	11. <i>P. commutata</i>
8	Apothecial disc KC+ orange-red; lecanoric acid present (4:)	111. <i>P. velata</i>
8:	Apothecial disc KC+ violet; picrolichenic acid present	9
9	Apothecial disc UV+ yellow; lichexanthone present (8:)	10. <i>P. clarkeana</i>
9:	Apothecial disc UV-; lichexanthone absent	108. <i>P. truncata</i>

### Group K

[Thallus corticolous; apothecia disciform; asci 1- or 2-spored]

1	Ascospores 2 per ascus	4. <i>P. asiana</i>
1:	Ascospores 1 per ascus	2
2	Thallus Pd+ yellow or orange (1:)	3
2:	Thallus Pd-	6
3	Thallus K-, Pd+ orange; protocetraric acid present (2)	41. <i>P. lacericans</i>
3:	Thallus K+ yellow or K+ yellow → red, Pd+ yellow	4
4	Thallus K+ yellow → red, Pd+ yellow; norstictic acid present (3:)	94. <i>P. sublacerans</i>
4:	Thallus K+ yellow	5
5	Apothecial discs adnate on the thallus; haemathamnolic acid present (4:)	11. <i>P. commutata</i>
5:	Apothecial discs on verruca-like swellings; thamnolic acid present	58. <i>P. miscella</i>
6	Thallus KC-, K+ violet; hypothamnolic acid present (2:)	65. <i>P. novaezelandiae</i>
6:	Thallus KC+ orange-red or violet, K-; hypothamnolic acid absent	7
7	Thallus KC+ orange-red; lecanoric acid present (6:)	111. <i>P. velata</i>
7:	Thallus KC+ violet; picrolichenic acid present	8
8	Apothecial disc 0.5–1.5 mm diam., plane; thallus containing lichexanthone (8:)	10. <i>P. clarkeana</i>
8:	Apothecial disc 1–3 mm diam., deeply concave; thallus containing atranorin	71. <i>P. patellifera</i>

### Group L

[Thallus corticolous; apothecia disciform; asci 8-spored]

1	Apothecial disc K-, KC-; no lichen compounds present	38. <i>P. jamesii</i>
1:	Apothecial disc K+ yellow or KC+ violet	2
2	Thallus K+ yellow, KC-, containing thamnolic acid (1:)	99. <i>P. thamnolica</i>
2:	Thallus K+ weak orange-brown, KC+ violet, containing picrolichenic acid	108. <i>P. truncata</i>

### Group M

[Thallus saxicolous, sorediate or isidiate, sterile]

1	Thallus isidiate; squamatic acid present	62. <i>P. nerrigensis</i>
1:	Thallus sorediate; squamatic acid absent	2
2	Thallus UV+ yellow; lichexanthone present (1:)	97. <i>P. subventosa</i>
2:	Thallus UV-; lichexanthone absent	90. <i>P. sordida</i>