

## PELTULA

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*Peltula* Nyl., *Ann. Sci. Nat. Bot.*, sér. 3, 20: 316 (1853) and *Mém. Soc. Sci. Nat. Cherbourg* 2: 322 (1853); derived from the Latin *pelta* (a small shield), in reference to the appearance of the squamules of the type species.

Type: *Peltula radicata* Nyl.

Thallus crustose-squamulose, or squamules peltate or subfruticose, rarely cylindrical, sometimes effigurate, anchored by rhizines or an umbilicus; olive-green to olive-brown, rarely black, with or without soredia, rarely isidiate. Upper cortex usually absent, but an epinecral layer is present; medulla white, composed of globose or elongate hyphae with numerous air spaces. Lower cortex usually well developed and pseudoparenchymatous. Apothecia lecanorine, completely immersed or with a raised rim; disc punctiform or open; hymenium 90–300 µm high; subhymenium 16–70 µm high. Paraphyses usually simple, rarely branching and anastomosing, 1–3.5 µm thick. Asci clavate to obclavate, 60–170 × 10–30 µm; wall orange, red or blue in iodine (usually blue after pretreatment with KOH). Ascospores globose, ellipsoidal or bacilliform, 3–12 × 2–6 µm. Conidiomata pycnidial, solitary, cerebriform, immersed; conidia oval to fusiform, hyaline, 1.5–4.3 × 0.5–2.5 µm.

Chemistry: Secondary metabolites are known from only one species, the Australian endemic *P. langei*.

A genus of 39 species; 15 species are known in Australia, two of them apparently endemic. They usually inhabit acidic or calcareous rocks and sandy soils in arid and semi-arid regions.

Soil-inhabiting species are broadly similar in appearance to species of *Heppia* and *Catapyrenium*. The latter, however, has perithecia and a green algal photobiont, while *Heppia* has 8-spored, prototunicate asci without an apical apparatus.

C.M.Wetmore, The lichen family Heppiaceae in North America, *Ann. Missouri Bot. Gard.* 57: 158–209 ('1970') [1971]; B.Budel, Zur Biologie und Systematik der Flechtengattungen *Heppia* und *Peltula* im sudlichen Afrika, *Biblioth. Lichenol.* 23: 1–105 (1987); R.B.Filson, The lichen genera *Heppia* and *Peltula* in Australia, *Muelleria* 6: 495–517 (1988); J.M.Egea, Los generos *Heppia* y *Peltula* (Liquenes) en Europa Occidental y Norte de Africa, *Biblioth. Lichenol.* 31: 1–122 (1989); B.Budel, J.A.Elix & H.Streimann, Collections of the lichen genus *Peltula* from the Kimberleys, Western Australia, *Australas. Lichenol. Newsl.* 32: 11–15 (1993); B.Budel & J.A.Elix, *Peltula langei* Budel et Elix spec. nov. from Australia, with remarks on its chemistry and the ascoma of *Peltula clavata* (Krempelh.) Wetmore, *Biblioth. Lichenol.* 67: 3–9 (1997).

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|----|---|---------------------------|
| 1  | Thallus sorediate.....  | 2                         |
| 1: | Thallus not sorediate.....  | 4                         |
| 2  | Thallus crustose-squamulose; marginal squamules effigurate; central squamules sorediate(1)..... | 12. <b>P. placodizans</b> |
| 2: | Thallus a single peltate squamule.....  | 3                         |
| 3  | Thallus to 2 mm wide; apothecia immersed, but with a raised rim(2:)......                       | 1. <b>P. bolanderi</b>    |
| 3: | Thallus to 12 mm wide; apothecia without a raised rim.....                                      | 5. <b>P. euploca</b>      |
| 4  | Thallus crustose-squamulose; marginal squamules effigurate(1:)......                            | 5                         |
| 4: | Thallus squamulose; marginal squamules not effigurate.....                                      | 6                         |

- 5 Central squamules to 0.5 mm wide; upper surface slightly flattened; apothecia immersed; disc punctiform, red-brown to blackish; ascospores  $4.5-8 \times 3-4.5 \mu\text{m}$ (4) ..... **12. P. placodizans**
- 5: Central squamules obconical to clavate or cylindrical, to 0.5 mm wide and 0.8 mm tall; marginal squamules sometimes prostrate and ribbon-like; apothecia immersed; disc usually widely opened, red to blackish brown; ascospores  $3.5-5 (-7) \times 2.4-3.5 (-4) \mu\text{m}$ ..... **7. P. impressa**
- 6 Squamules peltate, solitary or aggregated(4: )..... 7
- 6: Squamules subfruticose, rosette-shaped, orbicular to lobate and plane, or hemispherical and with a short stalk ..... 10
- 7 Thallus to 2.5 mm wide, blackish brown, almost hemispherical(6)..... **10. P. omphaliza**
- 7: Thallus larger, yellowish or bright olive or olive-brown; upper surface plane ..... 8
- 8 Thallus deeply divided into 3-5 lobes(7: ) ..... **14. P. rodriguesii**
- 8: Thallus not lobate ..... 9
- 9 Thallus saxicolous; squamules olive-green or olive-brown, plane or with down-curved margins, sometimes overlapping like roofing tiles, attached to the substratum by an umbilicus(8: )..... **5. P. euploca** (immature thalli)
- 9: Thallus terricolous; upper surface yellowish, attached to the substratum by a thick branched rhizine from the centre of the lower surface..... **13. P. radicata**
- 10 Thallus subfruticose(6: ) ..... 11
- 10: Thallus rosette-shaped, orbicular to lobate and plane, or hemispherical with a short stalk..... 12
- 11 Lobes club-shaped, to 1.5 mm long, usually not branched (if branched then usually from the base); medulla often hollow(10) ..... **2. P. clavata**
- 11: Lobes cylindrical, to 4 mm long, somewhat branched; tips sometimes flattened; medulla not hollow, but with air spaces ..... **4. P. cylindrica**
- 12 Thallus saxicolous(10: )..... 13
- 12: Thallus terricolous (very rarely on detritus over rock)..... 16
- 13 Squamules not swollen or appearing inflated, often rosette-shaped, attached by an umbilicus or a few rhizines; apothecia 1 (-2) per squamule; epihymenium K+ red or K-(12) ..... **9. P. obscurans**
- 13: Squamules convex or appearing inflated ..... 14
- 14 Squamules appearing inflated, mushroom-shaped when seen from the side, to 3.8 mm wide; upper surface canaliculate; apothecia immersed, usually 1 per squamule(13: ) ..... **8. P. langei**
- 14: Squamules convex with lobate margins and down-curved lobes; apothecia 1-7 or more per squamule15
- 15 Squamules to 7 mm high and 5 mm wide, stalked; stalk flattened; apothecial disc punctiform(14: ) ..... **3. P. congregata**
- 15: Squamules 0.5-3 mm high, somewhat lobed, with down-curved margins, attached by a short central stalk or umbilicus; apothecial disc widely exposed ..... **15. P. zahlbruckneri**
- 16 Thallus lobate; lobes imbricate, less than 1 mm wide(12: ) ..... **6. P. imbricata**
- 16: Thallus squamulose; squamules peltate, concave to plane, with or without a rim ..... 17
- 17 Squamules sessile, plane or slightly concave, olive to grey, attached by a dense tuft of hyphae; margins curved upwards; apothecia immersed, 1 (-8) per squamule, with a raised thalline rim(16: ) ..... **11. P. patellata**
- 17: Squamules almost completely immersed, only the upper surface exposed, yellowish, sometimes wrinkled, attached to the substratum by a thick branched rhizine from the centre of the lower surface; apothecia immersed, 1 per squamule, with a widely exposed red to brownish disc ..... **13. P. radicata**