



PSORA ¹

Gintaras Kantvilas ²

Psora Hoffm., *Deutschl. Fl.* 2: 161 (1796).

Type: *P. decipiens* (Hedwig) Hoffm.

Thallus squamulose; squamules adnate or ascending and attached by one end, frequently pruinose, with an upper cortex of vertically orientated, thick-walled hyphae overlain by an epinecral layer, also corticate below; rhizines lacking; prothallus lacking; medulla containing calcium oxalate. Photobiont a green coccoid alga with ± globose cells 7–16 µm wide. Ascomata apothecia, biatorine, laminal or marginal, broadly adnate or basally constricted. Disc plane to convex, indistinctly marginate or immarginate, brown to black, commonly pruinose. Proper exciple black or ± concolorous with the disc, in section annular, composed of conglutinated, radiating, thick-walled hyphae with narrow lumina. Hypothecium hyaline to pale brown. Hymenium hyaline or suffused brownish, I+ blue, strongly and persistently conglutinated, overlain by a darker pigmented epihymenial layer, sometimes also containing K+ crimson-red anthraquinone pigments. Paraphyses sparingly branched and anastomosed, with capitate apices. Asci 8-spored, of the *Psora*-type: clavate-cylindrical, with a more intensely amyloid wall and a well-developed, amyloid tholus penetrated by a more intensely amyloid, rather broad, diverging ring-structure; ocular chamber short and narrow when young, soon disappearing. Ascospores simple, hyaline, ellipsoid, non-halonate. Conidiomata pycnidia, laminal, immersed. Conidia bacilliform. Chemistry: a wide range of substances and substance types has been recorded in the genus; several species display different chemical strains.

A genus of c. 30 conspicuous, squamulose species, found mostly on soil in areas of low rainfall. In Tasmania, the genus (represented by only two species) has a highly localised distribution, mainly in grasslands and grassy woodlands. Although not regarded as rare, its occurrence is very patchy and limited to relict patches of vegetation or to protected microhabitats.

Key references: Schneider (1979); Timdal (1984, 1986); Lumbsch & Kothe (1993).

1 Squamules dull brownish grey to brown, with the upper surface deeply cracked into angular polyhedrons; apothecia laminal, adnate, plane to convex, commonly pruinose

1 *P. crystallifera*

Squamules dull brown to orange-brown, sometimes pinkish brown, with the upper surface smooth or cracked, but not forming angular polyhedrons; apothecia chiefly marginal, basally constricted, strongly convex to subglobose, epruinose

2 *P. decipiens*

1 *Psora crystallifera* (Taylor) Müll.Arg.

Flora 71: 140 (1888); —*Lecidea crystallifera* Taylor, *London J. Bot.* 6: 148 (1847); *Eremastrella crystallifera* (Taylor) Gotth. Schneid., *Biblioth. Lichenol.* 13: 76 (1979).

Squamules dull brownish grey to brown, 1–8(–10) mm wide, to 0.6 mm thick, at first rather neatly roundish and adnate, later becoming divided, contiguous and crowded together, sometimes overlapping, plane to undulate, typically rather crumpled when well-developed, with the margins entire at first, but soon becoming crenate, then ragged, eroded and pruinose, a little upturned and free of the substratum, forming

1 This work can be cited as: Kantvilas G (2024). *Psora*, version 2024:1. In MF de Salas (Ed.) *Flora of Tasmania Online*. 3 pp. (Tasmanian Herbarium, Tasmanian Museum and Art Gallery: Hobart). <https://flora.tmag.tas.gov.au/lichen-genera/psora/>

2 Tasmanian Herbarium, Tasmanian Museum & Art Gallery, PO Box 5058, UTAS LPO, Sandy Bay, TAS 7005, Australia.

extensive irregular colonies intermixed with other lichens; upper surface deeply cracked into angular polyhedrons from the earliest stages, these becoming 4–5-sided, 1–3 mm wide, well-separated by deep fissures, apically flat or pointy, rather glossy and crystalline, pruinose with crystals of calcium oxalate; lower surface pale brown. Apothecia laminal, adnate, roundish or shallowly lobate, to 2 mm wide, hemiangiocarpic and erupting from the surface of the squamules; disc plane at first, becoming convex, black, sparsely whitish grey-pruinose, thinly marginate; proper exciple black, soon \pm excluded, in section 30–40 μm thick, purple-brown at the outer edge, hyaline within. Hypothecium 35–50 μm thick, hyaline. Hymenium 75–90 μm thick, hyaline to suffused purple-brown, with the epihymenial layer purple-brown and intensifying in K; paraphyses 1.5–2 μm thick, with apices brown, 2.5–3 μm wide; asci 55–70 \times 12–16 μm . Ascospores 11–14.1–16.5(–18) \times 5–6.8–8(–8.5 μm). Pycnidia not seen.

Chemistry: nil; all spot tests negative.

A characteristic species of the arid rangelands of mainland Australia, also known from southern Africa and reported (rather unusually) from Hong Kong. It is seemingly uncommon in Tasmania, where it has been collected from low rainfall, lowland locations in the east, growing on soil in degraded pasture, grassland or grassy woodland. It is recognised by its dull brownish, rather crumpled lobes, the very characteristic polyhedral cracking and division of its upper surface, and its relatively large, adnate apothecia. On close study, the great majority of herbarium records of this species proved to be the more common *Psora decipiens*, which can also sometimes have a fissured upper surface, but which differs clearly by having pinkish or red-brown, often concave lobes, marginal, strongly convex apothecia, and red-brown (rather than purple-brown) apothecial pigment.

Sorell Rivulet, 42°42'S 147°35'E, 1970, G.C. Bratt 70/274 & G. Degelius (HO); Nile Road near Vineys Creek, 41°42'S 147°24'E, 200 m, 2001, G. Kantvilas 737/01 (HO); Swanston Private Nature Reserve, 42°20'S 147°48'E, 300 m, 2003, E. Daley 32 (HO).

2 *Psora decipiens* (Hedw.) Hoffm.

Descr. *Adumb. Plant. Lich.* 2: 68 (1794); —*Lichen decipiens* Hedw., *Vidensk. Meddel. Naturhist. Foren. Kjøbenhavn* 2: 7 (1789).

Squamules dull brown to orange-brown, sometimes pinkish brown, 0.7–3 mm wide, to 0.4 mm thick, adnate, at first neatly roundish and concave with slightly raised, entire or abraded and whitish margins, later becoming concave to undulate with the margins often deflexed, scattered or contiguous but not overlapping, forming extensive irregular colonies many tens of cms wide; upper surface mostly smooth and glossy, sometimes irregularly shallowly to deeply cracked and revealing the white medulla, rarely pruinose and then only very sparsely; lower surface pale brown. Apothecia marginal or submarginal, rarely laminal, basally constricted, roundish, becoming \pm subglobose, to 1.3 mm wide, sometimes fused in clusters, frequently formed around the perimeter of the squamules; disc convex, dark brown to brown-black, epruinose, immarginate; proper exciple in section 40–60 μm thick, deflexed, diffusely red-brown to hyaline. Hypothecium 60–100 μm thick, pale red-brown to hyaline, becoming massive and poorly differentiated from subhypothecial tissues in the most convex apothecia. Hymenium 80–100 μm thick, hyaline to suffused reddish brown, with a deep red-brown epihymenium; paraphyses 1.5–2.5 μm thick, with apices unpigmented and slightly expanded to 3–4 μm wide; asci 55–70 \times 10–18 μm . Ascospores (10.5–)11–13.6–16(–18) \times 5–6.0–7 μm . Pycnidia not seen; conidia reported as 6–7 \times 1 μm (Timdal 1986).

Chemistry: highly variable across its world range, with three chemical races recorded in Tasmania (norstictic acid; nil substances; and an unknown substance appearing as a slow-moving yellow spot on developed TLC plates); spot tests are unreliable.

Cosmopolitan on soil in open, sunny habitats. It is widespread at low elevations in the eastern parts of Tasmania, usually occurring on dolerite- or basalt-derived soil in grassland and dry sclerophyll woodland. As well as potentially forming extensive, continuous patches on otherwise bare soil, this species has a remarkable knack of colonising the most localised microhabitats, such as narrow pockets of consolidated soil between small stones or exposed tree roots, or in the shelter of larger boulders. A study by Leavitt *et al.*

(2018) suggests that across its global range, *P. decipiens* (which is based on a European type) includes several geographically separated cryptic species. These authors also consider that secondary chemistry is of limited use in distinguishing the different lineages.

St Marys Pass, 41°34'S 148°12'E, 350 m, 1973, G.C. Bratt 73/618 (HO); Pontville, Church of England cemetery, 42°41'S 147°16'E, 70 m, 2002, G. Kantvilas 579/02 (HO); Mt Forestier summit area, 42°55'S 147°51'E, 315 m, 2020, G. Kantvilas 94/20 (HO).

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