Flora of Tasmania online

ACAROSPORA [1]

Gintaras Kantvilas [2]

Acarospora A.Massal., *Ric. Auton. Lich. Crost.*: 27 (1852).

Type: *A. schleicheri* (Ach.) A.Massal.

Thallus crustose, areolate or squamulose, corticate. Photobiont a unicellular green alga with ± globose to rhomboid cells 8–20 µm wide. Ascomata apothecia, aspicilioid, sunken in the thallus surface, with or without a thin rim. Disc roundish to irregular, variously yellowish, brownish or black, pruinose or epruinose. Proper exciple cupulate, typically highly reduced. Hypothecium hyaline to pale yellow-brown. Hymenium hyaline, sometimes amyloid (I+ blue) or hemiamyloid (KI+ blue), not inspersed. Asci of the *Acarospora*-type: elongate-clavate, multi-spored, with a well-developed, thickened, non-amyloid tholus lacking internal differentiation and a thin, intensely KI+ blue outer wall; ocular chamber not developed. Paraphyses ± simple, entangled, sparsely anastomosed, conspicuously septate, 1.5–2.5 µm thick; apices sometimes capitate and pigmented. Ascospores very numerous in the asci (usually > 100), simple, hyaline, non-halonate, ovate to ellipsoid. Conidiomata pycnidia, immersed, not seen in most species. Conidia minute, shortly bacilliform to ovate-ellipsoid. Chemistry: variable, including norstictic acid, gyrophoric acid, rhizocarpic acid (yellow species) or fatty acids; many species lack substances.

A species-rich genus occurring on rocks and soil, widely distributed throughout the world and found on all continents including Antarctica. In general, species of *Acarospora* favour more arid environments and hence the genus is neither well-represented nor common in Tasmania. Molecular studies of the family Acarosporaceae (e.g. Westberg *et al.* 2015) have seen its subdivision into more natural units, the redistribution of some species between *Acarospora* and the related *Sarcogyne*, and the subsuming of *Polysporina* (e.g. Knudsen *et al.* 2021). However, as none of this work has included Southern Hemisphere taxa, the more traditional circumscription of *Acarospora* and its relatives is followed here. Critically, pending detailed studies of Acarosporaceae in the Australasian region, the genus *Polysporina* is retained for the endemic species, *P. terricola*, which was transferred to *Acarospora* by Knudsen & Kocourková (2015). Nor is the genus *Myriospora* applied to any Tasmanian species. Consequently this account is provisional and based largely on accounts and specimens of Northern Hemisphere taxa.

Key references: Knudsen (2007); Knudsen *et al.* (2019, 2021); Knudsen & Kocourková (2015); Westberg *et al.* (2015).

1	Thallus bright yellow	1 *A. citrina*
	Thallus a shade of pale grey or brown, or inapparent	2
2(1)	Thallus usually conspicuous, a shade of brown; apothecia immersed in the thallus, aspicilioid, not carbonised	3
	Thallus pale greyish to inapparent; apothecia ± superficial to somewhat sunken in the substratum, lecideine, with a strongly carbonised, fissured margin and a carbonised, contorted disc	*Polysporina terricola* +

1 This work can be cited as: Kantvilas G (2023). *Acarospora*, **version 2023:1**. In MF de Salas (Ed.) *Flora of Tasmania Online*. 4 pp. (Tasmanian Herbarium, Tasmanian Museum and Art Gallery: Hobart). **https://flora.tmag.tas.gov.au/lichens/genera/acarospora/** (accessed 27 September 2022).

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

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3(2)	Thallus lacking lichen substances, with all spot test negative	4 A. veronensis
	Thallus either C+ red (containing gyrophoric acid) or K+ yellow→red (containing norstictic acid)	4
4(3)	Thallus C+ red (gyrophoric acid), best seen in squashes under the microscope	2 A. fuscata
	Thallus K+ yellow→red (containing norstictic acid), with squashes under the microscope producing red, needle-like crystals with the addition of K	3 A. tasmanica

+ (= *Acarospora tasmaniensis* Knudsen & Kocourková)

1 Acarospora citrina (Taylor) Zahlbr.

In K. Rechinger, *Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl.* 88: 28 (1913); —*Urceolaria citrina* Taylor, *London J. Bot.* 6: 158 (1847).

Thallus areolate to subsquamulose; areoles bright lemon-yellow or greenish yellow, irregular or minutely effigurate, plane to convex, smooth to rather wrinkled, 0.5–1.5(–2) mm wide, 400–900 µm thick, scattered, contiguous or imbricate and forming extensive colonies; photobiont cells in a continuous layer beneath the cortex. Apothecia immersed in the areoles, initally visible as numerous, minute, brownish specks, at maturity typically 1–2(–5) per areole, to 0.2(–0.3) mm wide, at length with the disc exposed, roundish or somewhat deformed-elongate, plane to weakly concave, pale yellowish brown to brown, epruinose, remaining sunken in the thallus but surrounded by a thin, raised thalline rim. Proper exciple I+ blue. Hypothecium 10–40(–100) µm thick, I+ blue. Hymenium 80–140(–180) µm thick, overlain by a yellow-brown to reddish brown epithecium in part dissolving in K; asci 80–125 × 15–24 µm; paraphyses with apices sometimes slightly expanded to 3.5–4 µm, not pigmented. Ascospores narrowly ellipsoid to ovate, 3–5 × 1.5–3 µm. Pycnidia not seen.

Chemical composition: rhizocarpic acid; thallus K–, KC–, C–, P–.

Easily recognised by the conspicuous, bright yellowish thallus and common in low rainfall areas on exposed rocks, especially on sandstone and mudstone. Although typically forming extensive colonies, interspersed with other crustose lichens, including other species of *Acarospora*, most Tasmanian specimens have poorly developed apothecia but are speckled with brownish apothecial initials. The species is widespread on the Australian mainland. In earlier literature, it was referred to as *A. schleicheri* (Ach.) A.Massal., a widespread Northern Hemisphere species.

Grasstree Hill, 42°47′S 147°21′E, 400 m, 1981, *G. Kantvilas 1011/81 & A. Henssen* (HO); Glen Morey Saltpan near Tunbridge, 42°09′S 147°29′E, 180 m, 1984, *A. Moscal 8800* (HO); road to Tooms Lake, 13 km beyond Ross, 42°08′S 147°34′E, 220 m, 1999, *G. Kantvilas 126/99* (HO).

2 Acarospora fuscata (Schrad.) Arnold

Flora 53: 469 (1871); —*Lichen fuscatus* Schrad., *Spic. Fl. Germ.*: 83 (1794).

Thallus areolate to subsquamulose; areoles pale brown to dark chestnut-brown, irregularly roundish to rhomboid, plane to convex, smooth and glossy, 0.3–0.9 mm wide, to 350 µm thick, scattered or, less commonly, forming contiguous colonies; photobiont cells in a continuous layer beneath the cortex. Apothecia immersed in the areoles, initally visible as numerous, minute, brownish specks, at maturity typically 1 per areole, to 0.1–0.2(–0.4) mm wide, with the disc exposed, roundish or somewhat deformed-elongate, concave, pale brown to dark brown, epruinose, remaining sunken in the thallus. Proper exciple I+ blue. Hypothecium 15–50 µm thick, I+ blue. Hymenium 90–120 µm thick, overlain by a brown epithecium in part dissolving in K; asci 85–110 × 15–25 µm; paraphyses with apices slightly expanded to 3–4.5 µm, sometimes pigmented. Ascospores narrowly ellipsoid to ovate, 3–7 × 2–3 µm. Pycnidia not seen.

Chemical composition: gyrophoric acid; thallus K–, KC+ reddish, C+ red, P–.

A cosmopolitan species, rarely collected in Tasmania but possibly overlooked, due to mostly being represented as scattered areoles amongst other lichens. It occurs on rocks from littoral to upland situations. The

C+ reaction, best observed in microscope squashes, is essential to distinguish it from *A. tasmanica* and *A. veronensis*. One Tasmanian specimen is heavily infected with an unidentified species of *Dactylospora*.

Bisdee Tier, 42°26'S 147°17'E, 640 m, 2009, *G. Kantvilas 265/09* (HO); Spring Bay Mill, Freestone Point, 42°33'S 147°56'E, 3 m, 2019, *G. Kantvilas 443/19* (HO); Stony Head MTA, *c.* 620 m SE of Black Rock Point, 40°59'31"S 147°03'50"E, 5 m, 2020, *G. Kantvilas 391/20* (HO).

3 Acarospora tasmanica Räsänen

Ann. Bot. Soc. Zool.-Bot. Fenn. Vanamo 21: 5 (1946). Type: Tasmania, Hobart, [on a] garden wall, ad saxa arenosa, [ix.] 1886, *R.A. Bastow* (holo—H!).

Thallus areolate to subsquamulose; areoles pale brown to dark chestnut-brown, irregularly rhomboid, occasionally minutely effigurate or lobate and with the margins slightly ascending, plane to convex, smooth and glossy, 0.3–1.5 mm wide, 200–400 µm thick, usually scattered amongst other lichens, less commonly forming continuous colonies to 10 cm wide; photobiont cells arranged in vertically orientated clumps, interspersed with bands of hyphae. Apothecia immersed in the areoles, initally visible as numerous, minute, brownish specks, at maturity typically 1–3(–5) per areole, to 0.15–0.3(–0.5) mm wide, with the disc ± exposed, roundish, concave, pale to dark red-brown, epruinose, remaining sunken in the thallus. Proper exciple I+ blue. Hypothecium 30–50 µm thick, I+ blue. Hymenium 120–190 µm thick, overlain by a red-brown epithecium in part dissolving in K; asci 95–130 × 16–30 µm; paraphyses with apices typically expanded to 4–5 µm and pigmented brown. Ascospores narrowly ellipsoid to ovate, 3.5–5 × 1.5–2 µm. Pycnidia rare; conidia 2–2.5 × 1.5 µm.

Chemical composition: norstictic acid; medulla K+ yellow→red, KC–, C–, P+ orange.

Distinguished readily from the other brown species (*A. fuscata* and *A. veronensis*) by its chemical composition, which is easily observed in squash preparations by the formation of red, needle-like crystals following the addition of K. This species is infrequently collected and, although most specimens are coastal, it can also extend to inland areas, occurring on exposed rocks and consolidated soil in low rainfall areas. At present, it is recorded only from Tasmania, but is very likely to be more widespread. The morphology of this species, the orientation of photobiont cells as seen in thin transverse sections, as well as the chemical composition suggest a close relationship (or possible conspecificity) with the cosmopolitan species *Acarospora smaragdula* (Wahlenb. ex Ach.) A.Massal., now classified in the genus *Myriospora*.

Old Beach Road, opposite the Cadburys factory, 50 m, 1984, *G. Kantvilas 299/84 & P. James* (BM, HO); Shag Bay, Derwent River Estuary, 2 m, 1993, *R.D. Seppelt 19193* (HO); above Black Gully Creek, 1 km NE of Hamilton, 42°33'S 146°51'E, 140 m, 1999, *G. Kantvilas 225/99* (HO).

4 Acarospora veronensis A.Massal.

Ric. Auton. Lich. Crost.: 29 (1852).

Thallus areolate to subsquamulose; areoles pale olive-brown to dull dark chestnut-brown, irregularly roundish to rhomboid, plane to convex, smooth, 0.2–0.6(–1.3) mm wide, 100–250 µm µm thick, scattered or in contiguous colonies; photobiont cells in a continuous layer beneath the cortex. Apothecia immersed in the areoles, typically 1–3(–4) per areole, to 0.1–0.6 mm wide, at maturity with the disc exposed, roundish or somewhat deformed by mutual pressure, concave, dark red-brown to brown-black, epruinose, remaining sunken in the thallus, sometimes with a single apothecium occupying the entire areole and appearing as a disc with a distinct, usually darker, thalline rim. Proper exciple I+ blue. Hypothecium 10–40 µm thick, I+ blue. Hymenium 75–100 µm thick, overlain by a brown epithecium in part dissolving in K; asci 55–90 × 12–20 µm; paraphyses with the apices usually expanded to 3.5–4 µm and pigmented pale brown. Ascospores narrowly ellipsoid to ovate, 3.5–5.5 × 2 µm. Pycnidia not seen.

Chemical composition: nil.

Cosmopolitan; rather common and widespread in Tasmania in the drier, eastern half of the island from coastal to sub-alpine situations. It typically occurs on exposed rocks in rather degraded or nutrient-enriched

habitats, such as on rocks in rough, grazing pasture or in the vicinity of bushwalkers' huts. It is best identified in the Tasmanian flora by the absence of chemical compounds.

Gowan Brae, eastern side of Nive River, 42°02'S 146°25'E, 810 m, 2014, *G. Kantvilas 134/14* (HO); Muddy Plains Road, 42°27'S 147°12'E, 326 m, 2016, *G. Kantvilas 145/16* (HO); Caves Hill, 42°49'S 147°23'E, 230 m, 2019, *G. Kantvilas 183/19* (HO, NY).

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INDEX