



## HYMENELIA <sup>1</sup>

Gintaras Kantvilas <sup>2</sup>

*Hymenelia* Kremp., *Flora* 35: 24 (1852).

Type: *H. prevostii* (Duby) Kremp.

*Ionaspis* Th.Fr., *Lich. Scand.* 1: 273 (1871); type: *I. epulotica* (Ach.) Blomb. & Forssell

Thallus crustose, ecorticate but frequently with a diffuse, pigmented outer layer. Photobiont either a unicellular green alga with subglobose to globose cells, or *Trentepohlia*. Ascomata apothecia, mostly aspicilioid, rarely ± gyalectoid, sunken in the upper surface of the thallus. Disc plane to concave or urceolate, pale pink to orange and ± translucent, or dark brown to black. Proper exciple forming a thin but distinct collar around the disc, in section ± cupulate, composed of conglutinated, vertically orientated hyphae, typically poorly differentiated from adjacent tissues. Hypothecium hyaline or weakly orange-brown. Hymenium hyaline, I+ blue, KI+ blue, overlain by a blue-green or granular, orange-brown epithecium. Paraphyses simple or sparingly branched, sometimes ± moniliform in the upper part; apices not capitate. Asci clavate, 8-spored, mostly of the *Hymenelia*-type, with a well-developed, non-amyloid tholus, a thin, weakly amyloid outer wall and lacking an ocular chamber. Ascospores simple, hyaline, ellipsoid, halonate, thin-walled. Conidiomata pycnidia, immersed. Conidia bacilliform. Chemistry: nil.

A small group of lichens found mostly in cool temperate to subpolar regions, characterised by a crustose thallus containing a green photobiont, usually aspicilioid apothecia immersed in the thallus surface, and mostly non-amyloid or weakly amyloid asci containing eight simple, hyaline ascospores. Many species have an attractive, bright orange, K- thallus, not to be confused with similarly coloured species of the genus *Caloplaca*, where the thallus is K+ purple. Separation of *Hymenelia* and the closely related *Ionaspis* remains problematic. In the past, this depended chiefly on the photobiont: trebouxoid in the former and *Trentepohlia* in the latter. Lutzoni & Brodo (1995) devised a new classification, based on new typifications of the genera and cladistic analysis of a broad suite of characters. In these authors' concept, the photobiont is a minor character, and the genera are separated chiefly by epihymenial pigments. Furthermore, *Hymenelia* tends to have wider ascospores and a thicker hymenium, and, unlike *Ionaspis*, includes many calcicolous and endolithic species. As a result of this work, many of the described species effectively 'swapped' genera. Kantvilas (2014) found this new classification difficult to apply, not that the previous, photobiont-based arrangement was much better, and opted to apply only the name *Hymenelia*, the older of the two generic names. This approach has been followed by some subsequent authors (Fryday & McCarthy 2018; Fryday 2019). Two species are treated here, but study of the genus in Tasmania is still incomplete and numerous collections remain unidentified.

Key references: Lutzoni & Brodo (1995); Fletcher *et al.* (2009); Kantvilas (2014); Fryday & McCarthy (2018); Fryday (2019).

- 1 On exposed, alpine rocks, forming extensive, continuous thalli many tens of cms wide  
On intermittently submerged rocks, mostly occurring as small thalli < 10 cm wide in a mosaic with other crustose lichens
- 1 *H. gyalectoidea*  
2 *H. lacustris*

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## 1 *Hymenelia gyalectoidea* Kantvilas

*Kanunnah* 7: 130 (2014). Type: Tasmania: Hartz Mtns, near start of track to Arve Falls, 43°13'S 146°46'E, 790 m, on dolerite plates in subalpine heathland, 25 July 2007, G. Kantvilas 280/07 (holo—HO!; iso—BM!, MSC!).

Thallus pale to bright rusty orange, sometimes patchily bleached pale greyish, forming extensive, continuous, irregular patches up to many tens of cms wide, deeply cracked, 200–750 µm thick; prothallus lacking; medulla white, I–, KI–; photobiont a unicellular green alga with individual cells globose to subglobose, rarely ± oblong, 6–10 × 5–10 µm, occurring singly or occasionally in pairs. Apothecia scattered, typically uncommon and inconspicuous, 0.2–0.35 mm wide, round or irregularly deformed-roundish, hemiangiocarpic, at first immersed in the thallus, at maturity usually adnate, urceolate to gyalectoid; disc pale orange to ± hyaline and translucent, concave, eventually excavate and eroded; proper exciple at first rather ragged and dentate, incurved, prominently extending above the level of the disc and thallus and ± obscuring the former, later becoming ± erect to recurved and abraded, concolorous with the thallus or paler and ± translucent, sometimes in part with a sparse orange pruina, in section 10–50(–60) µm thick at the sides, hyaline to pale orange, composed of branched and anastomosed hyphae 1–2 µm thick radiating from beneath the hypothecium. Hypothecium hyaline, 40–70 µm thick, typically interspersed with oil droplets. Hymenium 70–90(–110) µm thick, I+ grubby blue-green, KI+ intense blue, hyaline throughout or sometimes overlain by a continuous or patchy, granular, orange epithelial layer 20–40 µm thick; paraphyses 1–2 µm thick, sparingly branched and anastomosed, not moniliform; asci 60–85 × 12–30 µm, approximating a modified *Hymenelia*-type, with a well-developed, mostly ± non-amyloid tholus except for a diffuse, thin, intensely amyloid inner cap. Ascospores 12–15.3–20(–21) × (7–)8–10.0–13(–14) µm. Pycnidia occasional, scattered, immersed in the thallus, visible as slightly more heavily orange-pigmented specks, pierced by a minute hole, sometimes gaping a little and resembling incipient apothecia; conidia 3–6 × 0.8–1 µm.

Known only from Tasmania, where it is one of the most common and eye-catching saxicolous, crustose lichens in sunny, exposed aspects at alpine and subalpine elevations; found almost exclusively on dolerite. Its orange thallus is largely responsible for the orange-brown patterns of alpine boulder-fields, where it commonly occurs together with the equally extensive, pale lemon-yellow *Cameronia pertusarioides* Kantvilas. The generic placement of this species is provisional and it was described as a *Hymenelia* principally as this being a genus of “best fit”, in order to give this common and much-photographed lichen a usable name. The structure of the exciple, the amyloid reaction of the hymenium and, in particular, the anatomy of the asci with their amyloid inner cap are unusual characters for the genus, and possibly suggestive of alternative relationships, such as in the Trapeliaceae sens. lat. Resolution of the classification of this species requires further study, preferably with DNA-sequence data.

In habitats akin to those of *H. gyalectoidea*, especially on the Central Plateau, there is a further *Hymenelia*-like taxon that remains unidentified. It has a somewhat duller orange, deeply cracked thallus of areoles 0.5–1 mm wide, a chlorococcoid photobiont, scattered, apothecia-like structures with a deeply concave, glossy brown “disc” to c. 0.3 mm wide, lacks blue-green pigments, and has sparingly branched, non-capitate paraphyses 1–2 µm thick; no asci or ascospores have been observed and the generic classification of this taxon is unclear.

Mt Wellington summit peaks, 42°54'S 147°14'E, 1963, P.W. James (BM, HO); Forty Lakes Peak, 41°44'S 146°26'E, 1350 m, 2006, G. Kantvilas 384/06 (HO); Ben Lomond, Legges Tor, 41°32'S 147°39'E, 1560 m, 2022, G. Kantvilas 98/22 (HO).

## 2 *Hymenelia lacustris* (With.) M. Choisy

*Bull. Mens. Soc. Linn. Soc. Bot. Lyon* 18: 145 (1949); —*Lichen lacustris* With., *Arr. Brit. Pl. ed. 3, 4*: 21 (1796); *Ionaspis lacustris* (With.) Lutzoni, *Syst. Bot.* 20: 253 (1995).

Thallus rusty or pale orange to cream or pale fawn-brown in deep shade, effuse, usually deeply cracked, to c. 300 µm thick, forming irregular patches, often in mosaics with other lichens, sometimes with a thin, greyish, marginal prothallus; medulla white, I–, KI–; photobiont a unicellular green alga with individual cells

globose to subglobose, 7–14 × 6–12 µm. Apothecia 0.1–0.5 mm wide, round, scattered or clustered, aspicilioid; disc pale orange-pink to ± translucent pale greyish, widely exposed, smooth, persistently concave; proper exciple entire, extending slightly above the level of the disc and thallus and forming a collar, concolorous with the thallus or a little darker at the inner edge, in section 20–50 µm thick at the sides, hyaline but frequently densely interspersed with orange-brown granules that do not dissolve in K, especially at the edges, lacking photobiont cells. Hypothecium 40–60(–140) µm thick, not interspersed. Hymenium 60–90 µm thick, overlain by a granular, orange epithelial layer c. 10 µm thick, lacking blue-green pigments; paraphyses 1.5–2.5 µm thick, simple with apices mostly not enlarged but the apical cell sometimes 3–4 µm wide; asci 50–75 × 15–20 µm, of the *Hymenelia*-type. Ascospores (9–)10–13.3–16(–17) × 5–6.8–8 µm. Pycnidia occasional, scattered, immersed in the thallus, visible as slightly more heavily orange-pigmented specks resembling incipient apothecia; conidia 4–6 × 1 µm.

Cosmopolitan and intimately associated with aquatic habitats, occurring on siliceous rocks in flowing streams where it is seasonally inundated. It is poorly represented in herbarium collections but is possibly widespread although not common in Tasmania. The species is recognised by its pale to bright orange thallus and its aspicilioid apothecia that resemble a shallow, pale crater with a distinct rim. Several other crustose lichens that also have an orange thallus when growing in or near flowing water can be found in the same habitat. For example, *Poeltiaria tasmanica* Fryday can be confused with *H. lacustris* but differs by its amyloid medulla, dark brown to black, frequently gyrose or umbonate apothecial disc, and its *Porpidia*-type asci.

Arve River above Arve Falls, 43°13'S 146°46'E, 1993, P.M. McCarthy 613 & G. Kantvilas (HO, MEL); Macquarie River at Colonels Marsh, 42°10'S 147°49'E, 370 m, 2009, G. Kantvilas 25/09 (HO); Frankland River at bridge on Blackwater Road, 41°11'S 144°52'E, 80 m, 2015, G. Kantvilas 465/15 (HO).

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## INDEX

<b>C</b>	
<i>Caloplaca</i> .....	1
<i>Cameronia pertusarioides</i> .....	2
<b>H</b>	
<i>Hymenelia</i> .....	1, 2, 3
<i>Hymenelia gyalectoidea</i> .....	2
<i>Hymenelia lacustris</i> .....	2, 3
<i>Hymenelia prevostii</i> .....	1
<b>I</b>	
<i>Ionaspis</i> .....	1
	<i>Ionaspis epulotica</i> .....
	<i>Ionaspis lacustris</i> .....
	<b>L</b>
	<i>Lichen lacustris</i> .....
	<b>P</b>
	<i>Poeltiaria tasmanica</i> .....
	<i>Porpidia</i> .....
	<b>T</b>
	Trapeliaceae.....
	<i>Trentepohlia</i> .....