

DIPLATOMMA

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Diplotomma Flot., *Jahrsb. Schles. Ges. Vaterl. Kult.* 27: 97 (1849)

From the Greek *diploos* (two-fold) and *omma* (an eye), in reference to the double-margined apothecia.

Type: *D. alboatrum* (Hoffm.) Flot.

Thallus crustose, superficial, delimited or rarely effuse, continuous or rimose and areolate. Isidia, soredia and blastidia absent. Upper surface whitish, grey, dark grey or grey-brown. Prothallus present or absent. Upper cortex pseudoparenchymatous, densely packed with minute calcium oxalate crystals that are insoluble in K but form clusters of needle-shaped crystals in 10% sulfuric acid. Medulla usually well defined, white, containing calcium oxalate (H₂SO₄+). Lower cortex present or absent. Ascomata apothecia, zeorine, biatorine or lecideine, immersed at first, then emergent, adnate, with or without a spurious thalline margin; disc dark brown or black, plane or becoming convex with age, usually grey-white-pruinose. Epihymenium brown; hymenium colourless, I+ blue; hypothecium colourless to dark brown, semi-opaque. Paraphyses simple; apical cells enlarged, pigmented. Asci clavate to oblong-ellipsoidal, 8-spored, *Lecanora*-type; apex wall layers thickened; apex amyloid, with a distinct axial mass. Ascospores *Diplotomma*-type, 2-septate to submuriform, olive-grey to red-brown or brown, with rounded lumina, ovoid-oblong to fabiform, very thick-walled; apical internal wall-thickenings appearing before the septum is inserted (type-B ontogeny); torus thin or absent; spore surface smooth. Conidiomata pycnidial, immersed in the thallus, pale to dark brown above, colourless below; conidiophores of type V (*sensu* Vobis, 1980), acrogenous. Conidia ellipsoidal to bacilliform.

Diplotomma is a genus of c. six species, three of which grow on calcareous rocks and mortar, more rarely on bark, in temperate Australia. Initial molecular studies indicated that species of *Diplotomma* and *Diploicia* formed a monophyletic clade (Molina *et al.*, 2002; Crespo *et al.*, 2004) and, consequently, those authors considered the two genera to be synonymous. This was rejected in a genetic analysis carried out by Helms *et al.* (2003), a view that is adopted here.

References

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Key

- 1 Thallus K+ yellow then dark red; norstictic acid present.....**2. D. chlorophaeum**
1: Thallus K-; norstictic acid absent.....2
2 Ascospores 3-septate**3. D. venustum**
2: Ascospores submuriform.....**1. D. alboatrum**

1. *Diplotomma alboatrum* (Hoffm.) Flot., *Jahrsb. Schles. Ges. Vaterl. Kult.* 27: 97 (1849)

Lichen alboater Hoffm., *Enum. Lich. Eur.* [30] (1784); *Buellia alboatra* (Hoffm.) Th.Fr., *Gen. Heterolich.* 91 (1861). T: "häufig an alten Linden längs der Stasse bei Schleissenheim, München", Germany, 22 Apr. 1889, *F.C.G. Arnold* (Arnold, *Lich. Mon.* 55); neo: UPS *n.v.*, *fide* A.Nordin, *Symb. Bot. Upsal.* 31(3): 339 (1996).

Illustrations: V.Wirth, *Die Flechten Baden-Württembergs*, 2nd edn 194 (1995); A.Nordin, *op. cit.* 338, fig. 7A–C (1996); R.Moberg, *Nordic Lichen Fl.* 2: 90 (2002), all as *Buellia alboatra*.

Thallus 0.1–1.5 mm thick, continuous or rimose and areolate, up to 3 cm wide, occasionally becoming thicker and then lifting off the substratum and becoming subsquamulose in part; very rarely with a black prothallus. Upper surface chalky white to yellow-brown, pale grey or pale brown, matt, grey-white pruinose. Apothecia initially pseudolecanorine, becoming lecideine, 0.3–0.5 mm wide, numerous, round, immersed but soon adnate to sessile; proper margin thin, poorly developed, excluded with age in convex apothecia, black; young apothecia with a thalline veil or rim with thalline granules; disc plane to convex, black, usually grey-white- to white-pruinose. Excipulum 30–45 µm thick, poorly developed, differentiated into a pale inner and a dark brown outer part, K-, N-. Epihymenium 5–10 µm thick, K-, N-; hymenium not inspersed, 60–110 µm thick; hypothecium c. 150 µm thick, K-, N-. Paraphyses c. 2 µm wide, with distinctly broadened apical cells 5–6 µm wide, and brown caps. Ascospores olive-grey to brown, ellipsoidal, submuriform, with 3 horizontal septa and 1 or 2 longitudinal septa, 13–20 × 6.5–10.0 µm. Pycnidia rare; conidia bacilliform, 6–10 × 1 µm.

Chemistry: Thallus K-, KC-, C-, P-; no lichen substances detected.

Occurs in temperate Australia (W.A., S.A., N.S.W., Vic. and Tas.) where it grows on calcareous rocks and mortar; rarely on bark; also in Africa, Asia, Europe, North and South America and New Zealand.

W.A.: Rottnest Is., *N.Sammy 1094* (PERTH). S.A.: Ridley Natl Park, 18 km S of Swan Reach, *J.A.Elix 2204* (CANB). N.S.W.: 4 km S of Sturt Hwy along Tooleybuc Rd, Balranald area, *J.A.Elix 43120* (CANB). Vic.: Warrnambool, *F.R.M. Wilson 767* (G). Tas.: Hogan Is., Bass Strait, *A.Hope & R.Filson* (COLO).

This species is characterised by the small, initially immersed apothecia that become adnate to sessile. The apothecia are lecideine, with plane to convex pruinose discs and submuriform ascospores. The thallus lacks lichen substances.

2. *Diplotomma chlorophaeum* (Hepp ex Leight.) Kr.P.Singh & S.R.Singh, *Bull. Bot. Survey India* 26: 64 ('1984') [1985]

Lecidea chlorophaea Hepp ex Leight., *Lich. Fl. Great Brit.* 328 (1871); *Diplotomma chlorophaeum* (Hepp ex Leight.) Szatala, *Ann. Hist.-Nat. Mus. Nat. Hungar.*, n.s., 7: 280 (1956), *nom. inval.* T: unknown, *fide* A.Nordin, *Symb. Bot. Upsal.* 33(1): 53 (2001).

Illustration: K. van Herk & A.Aptroot, *Veldgids Korstmossen* 175 (2004).

Thallus 0.1–1.5 mm thick, continuous or rimose and areolate, up to 3 cm wide; prothallus absent. Upper surface chalky white to yellow-brown, pale grey or pale brown, matt, grey-white pruinose. Apothecia initially pseudolecanorine, becoming lecideine, 0.2–0.6 mm wide, numerous, round, immersed but soon adnate to sessile; proper margin thin, poorly developed, excluded with age in convex apothecia, black; young apothecia with a thalline veil or rim with thalline granules; disc plane to convex, black, epruinose. Excipulum 30–55 µm thick, poorly developed, differentiated into a pale inner and a dark brown outer part, K-, N-. Epihymenium 6–12 µm thick, K-, N-; hymenium not inspersed, 80–115 µm thick; hypothecium c. 150 µm thick, K-, N-. Paraphyses c. 2 µm wide, with distinctly broadened

apical cells 5–6 μm wide, and brown caps. Ascospores olive-grey to brown, ellipsoidal, 3-septate to submuriform, with 3-horizontal septa and 1 or 2 longitudinal septa, 14–28 \times 7.0–12.5 μm . Pycnidia rare; conidia bacilliform, 6–10 \times 1 μm .

Chemistry: Thallus K⁺ yellow then red, C⁻, P⁺ yellow-orange; containing norstictic acid (major), connorstictic acid (minor).

On coastal calcareous rock in Vic.; also in Africa, Asia, Europe, Macaronesia, North America and New Zealand.

Vic.: Warrnambool, 1885, *F.R.M. Wilson s.n.* (G, MEL; residual syntypes of *Buellia submaritima* Müll.Arg.).

Distinguished from *D. alboatrum* by the somewhat longer ascospores and the presence of norstictic acid.

3. *Diplotomma venustum* Körb., *Parerga Lichenol.* 179 (1860)

Buellia venusta (Körb.) Lettau, *Hedwigia* 52: 244 (1912). T: “Ad saxa calcarea in alpinis Carpathicis”, *Hazslinszky* (Körber, *Lich. Sel. German.* No. 191); lecto: UPS *n.v.*, *vide* A.Nordin, *Symb. Bot. Upsal.* 31(3): 346 (1996).

Illustrations: V.Wirth, *Die Flechten Baden-Württembergs*, 2nd edn 196 (1995); A.Nordin, *op. cit.* 346, fig. 10A–B (1996); R.Moberg, *Nordic Lichen Fl.* 2: 90 (2002); T.H.Nash III, C.Gries & F.Bungartz, *Lichen Fl. Greater Sonoran Desert Region* 3: colour pl. (2007), all as *Buellia venusta*.

Thallus 1.0–2.5 mm thick, rimose and areolate, often subeffigurate, to 7 cm wide, occasionally with a black prothallus. Upper surface chalky white to grey or yellow-brown, matt, \pm greyish white-pruinose. Apothecia initially pseudolecanorine, becoming lecideine, 0.3–1.2 mm wide, numerous, round, immersed but then adnate to sessile; proper margin thin, poorly developed, black; young apothecia with a thalline collar; disc plane to convex, black, usually greyish white- to white-pruinose. Excipulum 30–45 μm thick, poorly developed, differentiated into a pale brown inner and a dark brown outer part, K⁻, N⁻. Epihymenium 8–12 μm thick, K⁻, N⁻; hymenium not interspersed, 75–125 μm thick; hypothecium 150–230 μm thick, K⁻, N⁻. Paraphyses c. 2 μm wide, with distinctly broadened apical cells 5–6 μm wide, and brown caps. Ascospores olive-brown to brown, ellipsoidal, 3-septate or rarely with one longitudinal septum, often curved, 15–24 \times 6.5–10.0 μm . Pycnidia rare; conidia bacilliform, 9–12 \times 1 μm .

Chemistry: Thallus K⁻, KC⁻, C⁻, P⁻; no lichen substances detected.

Very rare on calcareous rocks in S.A.; also in Europe, North America, North Africa and Asia.

S.A.: Boundary Rd, 17 km N of Tailem Bend, *J.A.Elix* 43810, 43811 (CANB).

This species is characterised by its thick, chalky, subeffigurate thallus, the 3-septate ascospores and the absence of lichen substances.