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Usnea dasaea Stirt.

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***Usnea dasaea* Stirt.**

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Abstract

Usnea dasaea is reported for the first time from New Zealand.

Introduction

Corticolous specimens of *Usnea* collected in Northland and Tasman in 2004 could not be identified at the time using the key and descriptions in the first edition of the New Zealand lichen *Flora* (Galloway 1985). Thin-layer chromatography revealed the presence of salazinic, norstictic and galbinic acids, which did not match species then recognized in New Zealand. Reading the description of Australian *Usnea* species in Stevens (1999), it seemed possible that the specimens were *U. undulata* Stirt. although *U. undulata* was not recorded in New Zealand until the second edition of the *Flora* for saxicolous material (Galloway 2007), and Clerc & Herrera-Campos (1997) considered *U. undulata* to be a synonym of *U. dasaea* Stirt. Clerc (2004) later identified a specimen of *U. dasaea* from Australia, which suggested the species could also be present in New Zealand. Morphological and chemical examination of a wider range of specimens from the North Island and comparison with descriptions of *U. dasaea* confirm the presence of the species in New Zealand.

Materials and methods

Whole specimens were photographed using an Olympus Stylus TG4 camera. A Leica M 125 C microscope was used to examine the specimens in detail, and photographs were taken using LAS V4.12 software. Transverse sections of branches were used to measure CMA values (the relative thickness of the cortex (C), medulla (M), and axis (A) in the cross-section of a longitudinal branch, Clerc 1984, 1987). A modified Lactophenol cotton blue stain was used to stain the spinulose fibrils before mounting in GAW (glycerol : alcohol : water 1:1:1) and photographing with a Leica DM 1000 microscope using the same software. Thin-layer chromatography was carried out using the methods of Culberson (1972) and White & James (1985), using solvents C and G.

New record for New Zealand

Usnea dasaea Stirt., *Scott. Naturalist* 6, 104 (1881)

Figs 1, 2

Type: MADEIRA. Funchal, *Payne s.n.* (BM – holotype!). CMA: C = 9.5%, M = 26.5%, A = 28%.

Chemistry: usnic, norstictic, galbinic and salazinic acids, all in major concentrations.

Syn: *Usnea undulata* Stirt. *Scott. Naturalist* 6, 104 (1881).

Thallus grey-green to yellow-green, shrubby to subpendent, to 10–15 cm long; branching mixed isotomic/anisotomic; lower branches not constricted at the origin; smaller branches appearing slightly constricted at the origin, but articular cracks can mimic constrictions; trunk short, not pigmented; lower branches slightly inflated, terete to slightly ridged, foveoles present or absent, cylindrical, tapering, tips of branches tapering, articular cracks on branches few but typical at smaller branch origins; papillae seen on some specimens; spinulose fibrils present and often dense on at least some branches; fibrils easily break off and leave a slightly raised scar or fibercl on which soralia can develop; soralia punctiform and slightly raised on branches, eroding to form larger soralia in places, also developing on fibercl; isidiomorphs present in soralia. *Apothecia* sometimes present, terminal, subterminal, or lateral, variable in size, up to 4 mm in diam.; ray fibrils in a single row, variable in number and length; disc yellowish and pruinose; cortical thickness variable, 7–12% of the branch width; medulla dense, occasionally dense/lax, 24–31% of the branch width; axis narrow, 22–32% of the branch width, A/M 0.7–1.2, pigment absent in both the medulla and axis.

Chemistry: Usnic, salazinic, norstictic and galbinic acids, usually all in major quantities (TLC).

Diagnostic features

The presence of dense spinulose fibrils that can detach easily, leaving a slightly raised scar or fibercl on which soralia can develop, and the presence of salazinic, norstictic and galbinic acids.

Remarks

Until 2004, *U. dasaea* was known from North America, South America, Europe and Asia, but not from Australasia (Clerc & Herrera-Campos 1997). Clerc (2004) identified an *Usnea* specimen collected in Queensland, Australia (*H. Mayrhofer 2586*) as *U. dasaea*, and he realized that specimens of *U. dasaea* from Australia had been included with specimens of *U. cornuta* Körb (synonym *U. confusa* Asahina) by Stevens in 1999 (Clerc 2004). Fos & Clerc (2000) and Clerc (2004) considered that *U. dasaea* was closely related to *U. cornuta*, differing in having dense spinulose fibrils and in its chemistry (usnic, salazinic, norstictic and galbinic acids). Specimens of *U. dasaea* from New Zealand might have been confused with *U. cornuta* (*U. arida* in Galloway 1985), and also with *U. rubicunda* Stirt., but those species can be distinguished by the presence of dense spinulose fibrils (Figs 1 & 2) which detach easily and leave a slightly raised scar or fibercl on which soralia can develop, also by the presence of salazinic, norstictic and galbinic acids and by the lack of red cortical pigmentation. Specimens of *U. undulata*, now a synonym of *U. dasaea* (Clerc & Herrera-Campos 1997) in New Zealand herbaria could also prove to be *U. dasaea*.

The species has been collected from sea level to 807 m elev. from several sites in Northland, Auckland, Waikato, Whanganui-Manawatu, Tasman and Otago. As noted above, it often is confused with *U. rubicunda* and *U. cornuta*, so an examination of material from New Zealand herbaria is likely to show that it is widespread. So far, it is known from coastal pohutukawa (*Metrosideros excelsa*) forest, inland mixed broad-leaf native forest and a range of native and introduced trees and shrubs in suburban settings. It commonly occurs with *Usnea rubicunda*.

SELECTED SPECIMENS EXAMINED

North Island: ● Waitaraire Stream, near Takahue, Northland, 35°10'57"S, 173°21'02"E, 50 m alt., corticolous, *P. & J. Bannister s.n.*, xii.2004 (OTA59241); ● Governor's Bay, Moturoa Island, Bay of Islands, Northland, 35°12'25"S, 174°04'38"E, 0 m alt., fallen branch of pohutukawa, *E. Asquith s.n.*, 06.iv.2012 (UNITEC5423); ● Tarairae Valley, Motu Kaikoura, Hauraki Gulf, Auckland, 36°10'58"S, 175°19'11"E, 104 m alt., on dead shrub, *D. J. Blanchon & I.L. Emmis s.n.*, 11.vi.2008 (UNITEC4383); ● Hillcrest Rd, Orewa,

Hibiscus Coast, Auckland, 36°34'17"S, 174°41'26"E, 40 m alt., on plum tree in residential garden, *B. Davidson s.n.*, 16.ix.2010 (UNITEC4235); • Maywood Crescent, Glen Eden, Auckland, 36°55'03"S, 174°37'46"E, 58 m alt., growing on branch of silver birch in residential garden, *K. Crabbe s.n.*, 17.ix.2009 (UNITEC3901); • Hamilton Domain, Hamilton, Waikato, 37°47'46"S, 175°16'23"E, 38 m alt., on trees, *W. Martin A567*, 21.x.1964 (OTA59235).

South Island: • Takaka Walkway, Tasman, 41°01'56"S, 172°51'55"E, 5 m alt., corticolous, *P. & J. Bannister s.n.*, vi.2004 (OTA59293); • Eve's Bush, Brightwater, Tasman, 41°20'02"S, 173°03'14"E, 80 m alt., corticolous, *J. Bannister s.n.*, v.2004 (OTA68061); • Trotters Gorge, Otago, 45°24'10"S, 170°46'37"E, 180 m alt., on dead branch in mixed broadleaf forest, *J. Steel s.n.*, 8.ix.2018 (OTA71217).

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References

- Clerc, P (1984): Contribution à la révision de la systématique des usnées (Ascomycotina, *Usnea*) d'Europe 1. *Usnea florida* (L) Wigg. emend. Clerc. *Cryptogamie, Bryologie et Lichenologie* 5, 333–360.
- Clerc, P (1987): Systematics of the *Usnea fragileszens* aggregate and its distribution in Scandinavia. *Nordic Journal of Botany* 7, 479–495.
- Clerc, P (2004): Notes on the genus *Usnea* Adanson. *Bibliotheca Lichenologica* 88, 79–90.
- Clerc, P; Herrera-Campos, MA (1997): Saxicolous species of *Usnea* subgenus *Usnea* (lichenized Ascomycetes) in North America. *Bryologist* 100, 281–301.
- Culbertson, CF (1972): Improved conditions and new data for the identification of lichen products by a standardized thin-layer chromatographic method. *Journal of Chromatography* 72, 113–125.
- Fos, S; Clerc, P (2000): The lichen genus *Usnea* on *Quercus suber* in Iberian cork oak forests. *Lichenologist* 32, 67–88.
- Galloway, DJ (1985): *Flora of New Zealand Lichens*. P.D. Hasselberg, Government Printer, Wellington.
- Galloway, DJ (2007): *Flora of New Zealand Lichens*. 2nd edition, Manaaki Whenua Press, Lincoln.
- Stevens, GN (1999): A revision of the lichen family Usneaceae in Australia. *Bibliotheca Lichenologica* 72, 1–128.
- White, FJ; James, PW (1985): A new guide to microchemical techniques for the identification of lichen substances. *British Lichen Society Bulletin* 57 (supp.), 1–40.



Figure 1. *Usnea dasaea* (OTA71235). Scale bar = 1 cm.



Figure 2. *Usnea dasaea* (OTA71235), part of branch showing spinulose fibrils (stained with lactophenol cotton blue). Scale bar = 1 mm.