



Australasian Lichenology
 Number 77, July 2015 ISSN 1328-4401



Australasian Lichenology
 Number 77, July 2015 ISSN 1328-4401

The cosmopolitan *Candelaria concolor* gets its distinctive yellow colour from pulvinic acid derivatives. Corticolous on introduced *Quercus*, *Populus*, and *Betula*, the species is widespread in public parks and gardens in Australia and New Zealand.

1 mm 

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Pertusaria puffina A.W.Archer & Elix

Orhan A.H. Er, Chris L. Reynolds & Dan J. Blanchon

Biodiversity Management and Animal Welfare Research Group,
Department of Natural Sciences, Unitec Institute of Technology,
Private Bag 92025, Auckland, New Zealand
email: dblanchon@hotmail.com

Abstract

Pertusaria puffina A.W.Archer & Elix is reported for the first time from New Zealand.

Introduction

Pertusaria puffina A.W.Archer & Elix was first described from material collected on Lord Howe Island (Archer & Elix 1994). Since then the species has been reported from mainland Australia (Archer 2004), Papua New Guinea (Elix *et al.* 1997), Thailand (Mongkolsuk *et al.* 2011) and India (Rai *et al.* 2014), but not New Zealand (Galloway 1985, 2007 and de Lange *et al.* 2012). A search of mangroves in northern New Zealand discovered three populations in the Kaipara Harbour (Fig. 1), and a search through the unidentified *Pertusariae* in AK found a collection from the inner Hauraki Gulf (Fig. 1).

Materials and methods

Specimens were examined with standard microscopic techniques. Chemical constituents were identified with thin-layer chromatography (Culberson 1972, White & James 1985).

Pertusaria puffina A.W.Archer & Elix, *Teloepa* 6, 22 (1994)

(Adapted from Archer & Elix 1994) *Thallus* dull yellow, thin, cracked, smooth and glossy. *Isidia* absent. *Soralia* numerous, scattered, white to greenish white, disciform, 0.4–1.0 mm diam. *Apothecia* not seen.

Chemistry: Thallus K+ pale yellow, KC–, C–, Pd–; containing 2,4-dichlorolichexanthone (major), 2,5-dichlorolichexanthone (major), 2,4,5-trichlorolichexanthone (major), stictic acid (major), 2-chlorolichexanthone (minor) and constictic acid (minor).

Remarks

The species is characterized by a dull yellow, cracked thallus, numerous green-white discoid soralia (Fig. 2) and distinctive chemistry, including orange fluorescence under UV. Few other *Pertusaria* species can be mistaken for *P. puffina*, although the isidiate species *P. subisidiosa* A.W.Archer has a similar chemistry.

To date, *Pertusaria puffina* has been collected at only three locations in the Kaipara Harbour and one in the inner Hauraki Gulf (Fig. 1), with one or a few populations at each site. The species is corticolous on mainly mangroves (*Avicennia marina* subsp. *australasica* (Walp.) J.Everett, (Fig. 3) or less commonly on pohutukawa (*Metrosideros excelsa* Sol. ex Gaertn.) and other tree species occurring close to the mangroves, among them kanuka (*Kunzea robusta* de Lange & Toelken) and puriri (*Vitex lucens* Kirk). A survey of eight other Kaipara Harbour sites, 18 mangrove sites elsewhere in the upper North Island, and coastal pohutukawa trees across the Auckland Region failed to find the species. It appears to prefer high light environments, usually occurring on sheltered sides of the trunks and some branches of mature mangroves up to 2 metres above the ground. Lichens commonly associated with the species include *Crocodya aurata* (Ach.) Link, *Heterodermia japonica* (M.Satô) Swinscow & Krog, *Leptogium aucklandicum* Zahlbr., *Pannaria araneosa* (C.Bab.) Hue, *P. elixii* P.M.Jørg. & D.J.Galloway, *Parmotrema perlatum* (Huds.) M.Choisy, *P. reticulatum* (Taylor) M.Choisy, *P. subtinctorium* (Zahlbr.) Hale, *Pertusaria melaleuroides* Müll.Arg., *P. psoromica* A.W.Archer & Elix, *P. sorodes* Stirt., *Physcia tribacoides* Nyl., *Pyrenula sexlocularis* (Nyl.) Müll.Arg., *Stictia squamata* D.J.Galloway and *Usnea rubicunda* Stirt.

Pertusaria puffina is corticolous in Thailand (Mongkolsuk *et al.* 2011) and New Zealand, saxicolous in Lord Howe Island (Archer & Elix 1994), corticolous and saxicolous in eastern Australia (Archer 2012), and terricolous in Papua New Guinea (Elix *et al.* 1997) and India (Rai *et al.* 2014).

Conservation Status

The species appears to be very uncommon in New Zealand, having been collected at only three sites in the Kaipara Harbour and another in the inner Hauraki Gulf. In the Kaipara Harbour, it is perhaps in decline as a result of habitat disturbance and mangrove clearance. We estimate that the four populations total 250–1000 thalli in an area of less than 10 ha. Assuming that the populations are stable or declining only slowly, and considering that they are few, small, and geographically near to each other, we submit that the most appropriate threat status is “Nationally Endangered”, with the qualifier “Data Poor” (Townsend *et al.* 2008).

SPECIMENS EXAMINED

North Island: • Mataia Bay, Kaipara Harbour, 36°29'25"S, 174°25'54"E, 2 m alt., growing on *Avicennia marina* subsp. *australasica*, O. Er & C. Reynolds, 16.vii.2013 (UNITEC); • *loc. id.*, 2 m alt., growing on *Metrosideros excelsa*, O. Er & C. Reynolds, 28.viii.2014 (UNITEC); • *loc. id.*, 2 m alt., growing on *Vitex lucens*, O. Er & C. Reynolds, 28.viii.2014 (UNITEC); • Mataia Bluff, Kaipara Harbour, 36°29'38"S, 174°25'27"E, 1 m alt., growing on *Metrosideros excelsa*, D.J. Blanchon, 2.x.2014 (UNITEC); • Umupuia Reserve, Hunua Ecological District, 36°54'S, 175°05'E, 45 m alt., growing on *Beilschmiedia tawa*, D.B. Rogan, 21.ix.1996 (AK); • Umupuia Beach, Hunua Ecological District, 36°54'12"S, 175°04'52"E, 2 m alt., growing on *Metrosideros excelsa*, C. Reynolds, 14.ii.2015 (UNITEC).

Acknowledgements

We thank Gill and Kevin Adshead for site access and support, Dr Alan Archer and Professor Jack Elix for confirming the chemistry and identity of our initial specimen, Dr Peter de Lange for comments on the manuscript, and the Herbarium of the Auckland Institute and Museum (AK) for access to specimens.

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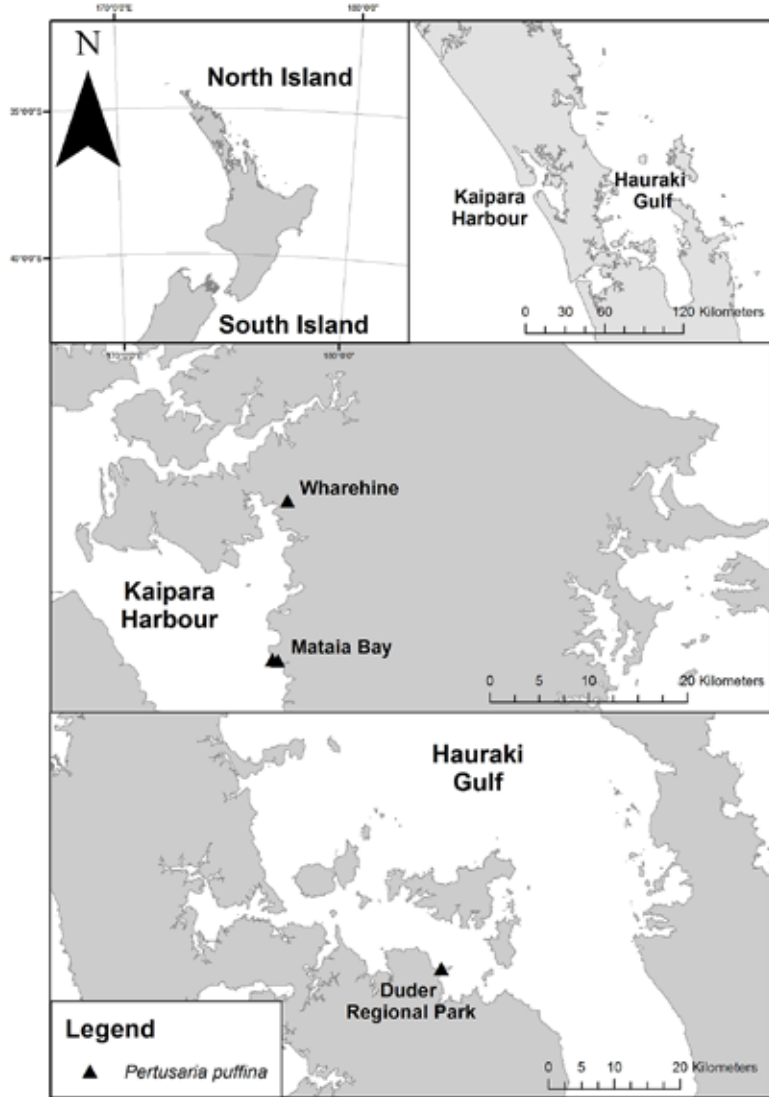


Figure 1. Sites where *Pertusaria puffina* has been collected in New Zealand (triangles).



Figure 2. Soralia of *Pertusaria puffina*, Mataia Bay, Kaipara Harbour. Bar = 2 mm.



Figure 3. Habitat of *Pertusaria puffina*, Mataia Bay, Kaipara Harbour.