Phytotaxa 39: 1–30 (2012)
www.mapress.com/phytotaxa/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

Novel alpine algae from New Zealand: Chlorophyta

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Abstract

Four new species, *Bracteacoccus ruber*, *Chlamydomonas palmellomoewusii*, *Elliptochloris philistinensis* and *Schizochlamydella orbicularis*, and three new monospecific genera, *Cryptodesmus ellipsoideus*, *Achoma brachiatum*, and *Variochloris pyrenoglobularis*, are described from cultured material isolated from alpine herbfield soil of Mt Philistine, New Zealand. New genetic information is also reported for *Pseudococcomyxa simplex*, which was cultured from the site previously.

Key words: biogeography, extremophiles, new species, green plants

Introduction

This paper describes new findings concerning the algal flora of the New Zealand alpine zone on Mt Philistine, Arthur's Pass National Park. Previous work using morphological and molecular data (Novis *et al*. 2008) established that three species found on the site have transoceanic distributions, with one (*Chrysocapsa flavescens*; Starmach 1985) being indistinguishable from an Australian strain, another (*Botrydiopsis constricta*; Broady 1976) likewise indistinguishable from several Antarctic isolates, and a third (*Chlamydomonas pseudogloeogama*; Gerloff 1940) being near-identical to a strain from Czechoslovakia. *Klebsormidium dissectum* (F. Gay) Ettl & Gärtner 1995 was also found on the site, and could not be distinguished from isolates recovered from elsewhere in New Zealand. These results suggested that the majority of algae on the site were widely distributed. Subsequently, we have recovered more strains from the same site and describe the chlorophyte representatives here. These include four new species of previously established genera, and three new monospecific genera. The erection of these new taxa is justified by phylogenetic analysis of molecular data. Additional genetic data are also provided for *Pseudococcomyxa simplex* (Mainx) Fott 1981, a species reported from the site previously.

Methods

Specimen collection, culture, and examination

Unialgal cultures of alpine algae were obtained from a collection site at 1640 m on Mt Philistine, Arthur's Pass National Park, New Zealand (42°53'20.189"S, 171°32'08.460"E). Cultures were grown on washed, agarised 10% BG-11 medium (Rippka *et al*. 1979) at 12°C under illumination of approximately 150 µmol photons m^{-2} s^{-1}. Isolates were purified using standard aseptic microbiological techniques, and photomicrographs were obtained using a Leica DC500 digital camera mounted on a Leica DMLB compound microscope with Nomarksi differential interference contrast optics.

Accepted by M. Christenhusz: 15 Dec. 2011; published online in PDF: 1 Jan. 2012