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Introduction

Saxicolous lecideoid lichens are rich in species, but only a few are known to occur in the extreme environmental conditions of continental Antarctica. They often act as pioneers on rock and pebbles. Despite of their ecological importance, knowledge of the diversity of lecideoid lichens in continental Antarctica is very poor. Only a few lecideoid lichens are mentioned in current species lists of lichens.

The diversity of lichen species was recorded along a north to south transect between 72° S to 84° S latitude (Fig.1) by R. Türk during five expeditions to Ross Sea Coast. The classification of crustose lichens with lecideoid apothecia, proved to be very difficult. Apparently, the extreme ecological conditions in Antarctica cause a high variability in thallus morphology. These modifications are difficult to interpret and, in many cases in the literature, such species have been falsely classified based on the variations.

Given the small amount of available sample material for comparison, such modifications can often remain unidentified. One prominent example is the Antarctic - endemic *L. cancriformis* (Hertel 2007). In the past four different morphotypes have been interpreted as different species (Castello 2003).

Consequently, the species concept in Antarctic lichens has been a matter of debate for a long time. Some authors claimed about 97 % of the Antarctic lichen species to be endemic, others considered ca. 20 % as being more realistic.

In our studies we have investigated on taxa which belong to the genus *Lecidea* s. lat. In addition to morphological and chemical analyses (HPLC) the ITS region was chosen as a variable enough molecular marker, which allows comparison of closely related species worldwide and from Genbank (Fig.2).

Investigation Sites

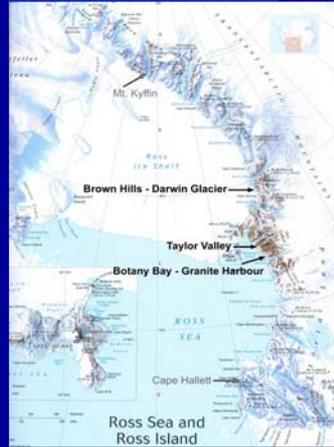


Fig. 1: Investigation sites, black letters: habitats of *Lecidea* species, grey letters: no *Lecidea* species

Brown Hills - Darwin Glacier
 400-450 masl, Dec. 2004
 -northern of Darwin Glacier
 -very dry part of the continental Transantarctic Range.

Taylor Valley
 0 - 1143 masl, Jan. 2003
 -classic dry valley, largest ice free area, cold desert with arid soils and exposed bedrocks
 -water sources are ice covered lakes, ephemeral streams and clouds

Botany Bay - Granite Harbour
 0 - 250 masl, Jan. 2000
 -snow free during the summer -protected from high winds
 -several small streamlets of melting water flow from the snow-fields of the adjacent ridges
 -exceptional moss and lichen vegetation

Results and Discussion

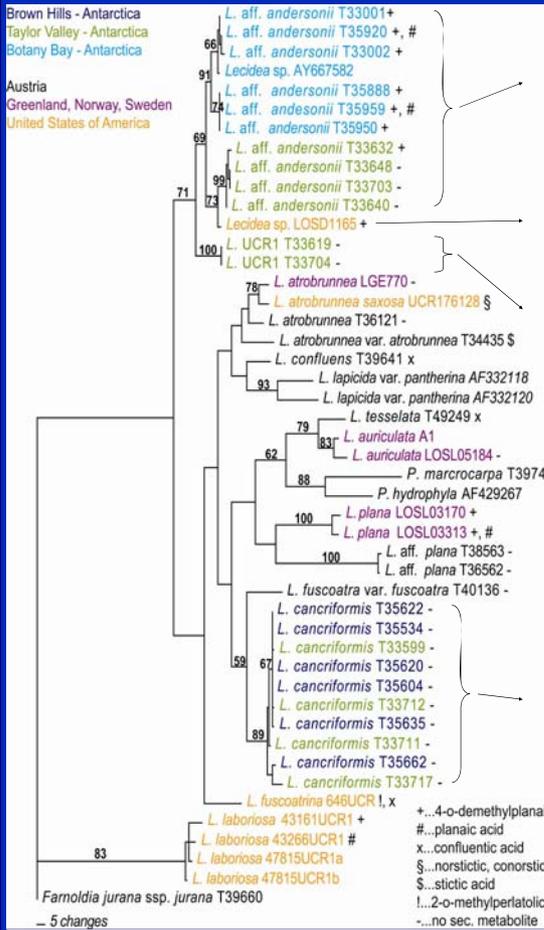


Fig. 2: Maximum Likelihood tree of *Lecidea*-species, Antarctic species combined with species from other continents - secondary metabolites included, ITS1-5.8rRNA-ITS2. Garti 0,951, GTR+G+I Images: Thallus, cross section apothecium, ascus with spores



- *Lecidea* aff. *andersonii* Filson 1974
 -Morphological characters of *Lecidea* aff. *andersonii* agree well with *L. andersonii* (Medulla > I+)
 -No presence of stictic acid, confluent and glomelliferic acids which were reported in literature > but instead 4-o-demethylplanaic acid and planaic acid
 -No biosynthetically relationship to stictic, confluent or glomelliferic acids.
 -Possibility that our samples represent a chemical race of *L. andersonii* or an undescribed species.
 -Form two distinct clades > both of which either contain 4-o-demethylplanaic and in two cases additionally planaic acid (Botany Bay) while other *Lecidea* aff. *andersonii* samples (Taylor Valley) only one possess secondary metabolites but include a *Lecidea* sp. from USA.
 -Castello (2003) > Antarctic endemic
 -Hertel (2007) > bipolar species
- *Lecidea* URC1
 They differ from *Lecidea* aff. *andersonii* by a I-medulla, a well developed thallus and apothecia without a distinct margin. The ascospores are more distinctly ellipsoid and smaller than those of *Lecidea cancriformis*; the hypothecium is hyaline to rarely pale brown in contrast to dark brown in *L. cancriformis*.
 Although morphological and molecular evidence suggest that these two samples belong to a distinct lineage, we refrain from formally describing this as a new species until further samples become available.
- *Lecidea cancriformis* C.W. Doge & G.E. Baker 1938
 Conformity with descriptions of Hertel (2007), Castello (2003) and others, who mentioned it as extremely variable from endolithic growth to extremely thick and brownish glossy. Dominant at Brown Hills - Darwin Glacier. *L. cancriformis* was regarded as an Antarctic endemic, which is in agreement with our phylogenetic analyses.

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Literature:
 -Hertel, H. 2007: Notes on and records of Southern Hemisphere lecideoid lichens. *Bibliotheca Lichenologica*, 95, 267-296
 -Castello, M. 2003: Lichens of Terra Nova Bay area, northern Victoria Land (Continental Antarctica). *Studia Geobotanica*, 22, 3-54.

