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LICHENS AND LICHEN PARASITES FROM THE BRITISH - SWEDISH - NORWEGIAN ANTARCTIC EXPEDITION 1949-52 TO DRONNING MAUD LAND

D.O. ØVSTEDAL*

ABSTRACT. — 23 species plus 4-5 taxa of uncertain identity were recorded. For some taxa, taxonomic remarks are given. *Bacidia trachona* (Ach.) Lettau and *Caloplaca jungermanniae* (Vahl) Th. Fr. are reported for the first time from the Antarctic. «*Lecidea*» *oroantarctica* is described as new. Phytogeographical relations are discussed.

INTRODUCTION

The field members of the 1949-52 Norwegian - British - Swedish expedition to the Antarctic continent visited the rock outcrop area of western Dronning Maud Land between 2° and 12° W, and 71° 08' and 73° 40'S. A series of northeast-trending mountain ranges occurs with a rock-surface relief of more than 2500 m. The bedrock includes two distinct assemblages (ROOTS 1953). The first is composed of metamorphic rocks, mainly banded gneisses, amphibolites, schists and pegmatites. The second includes sedimentary rocks, mainly siltstones, greywaches and conglomerates. Volcanic rocks also occurred. The macroclimate of Dronning Maud Land is described by LINDSAY (1972). The vast majority of the Lichens examined was collected by Dr. O. Wilson, Sweden. The material is deposited in UPS.

List of localities

- | | |
|------------------|-------------------------|
| 1. Passat | 9. Lenestolen |
| 2. Førstefjell | 10. Doc's Berg |
| 3. Knallen | 11. Nunatak 1 A |
| 4. Station 218 F | 12. Røseberget |
| 5. Skorpberget | 13. Neumeyerveggen |
| 6. Ekberget | 14. Steinklumpen |
| 7. Nunatak 113 F | 15. Morainic boulder IX |
| 8. Pyramiden | 16. Søndre Portalbergen |

E.F. Roots collected at loc. 7; otherwise the collector was O. Wilson.

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Acarospora chlorophana (Wahlenb.) Mass. — **Syn.** *Biatorella cerebriformis* (Dodge) Filson, *B. antarctica* Murray. The species is common in the continental Antarctic.

Loc. : 1, 2, 16.

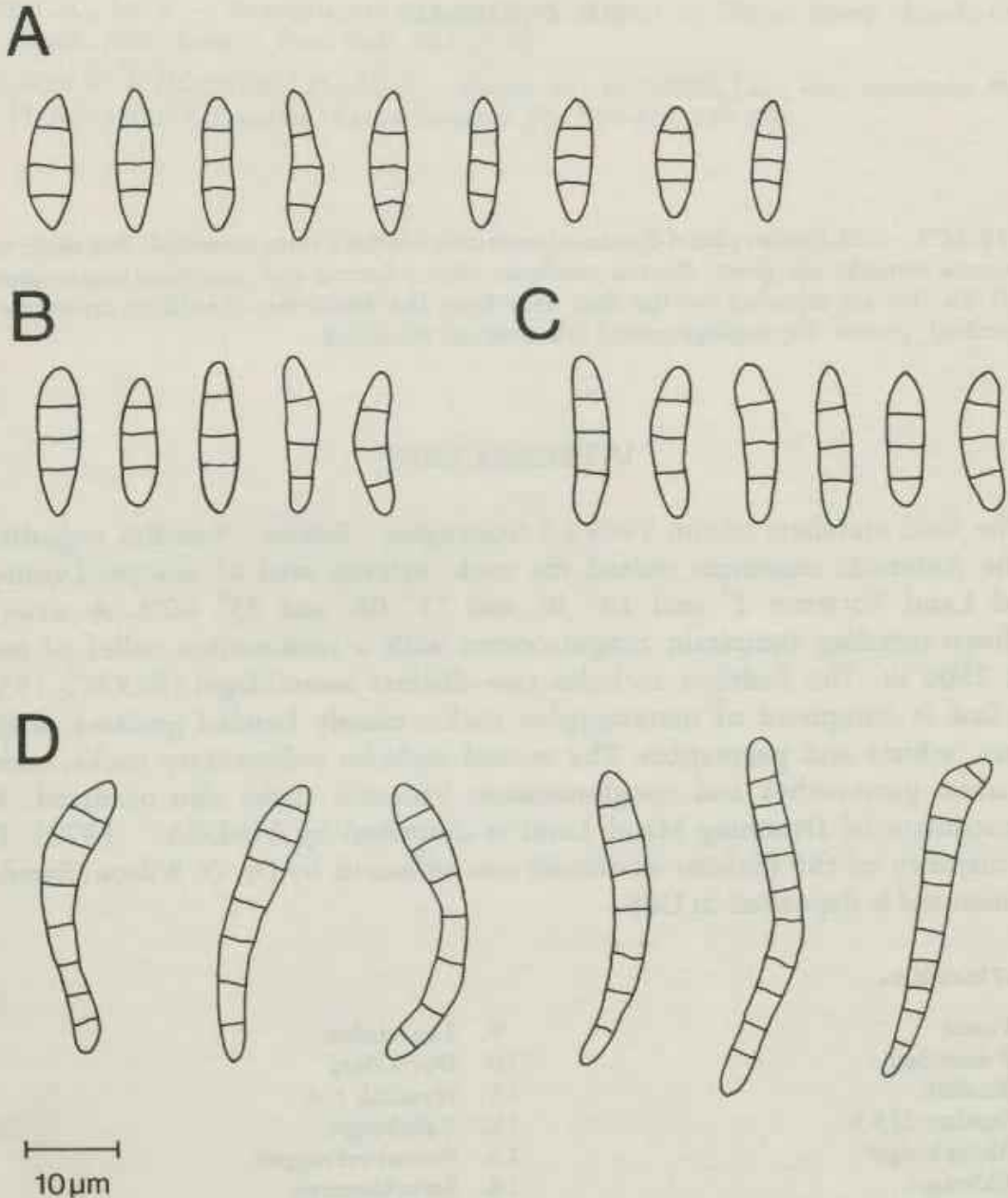


Fig. 1 — Spores of *Bacidia trachona* (A-C) and *B. stipata* (D). A : Antarctic, Dronning Maud Land (loc. 1); B : Norway, Troms, Tromsø, Fløyfjellet, leg. Th. M. Fries 1964 (UPS); C : Sweden, Jämtland, Areskutan, leg. S. Almquist 1808 (UPS), D : Antarctic, Dronning Maud land (loc. 1).

A. gwynnii Dodge et Rudolph — This species was recently discussed by ØVSTEDAL (1983). It differs from *A. chlorophana* mainly in growth form and chemistry. Common in the continental Antarctic.

Loc. : 1, 3, 4, 5, 6, 7, 16.

A. cf. williamsii Filson — The specimens were growing both on soil and on weathering rock. They are in all essential details in accordance with the description by FILSON (1966), but the type has not been seen.

According to the original description, the spores of *A. williamsii* measure $4.4,5 \times 2.2,5 \mu\text{m}$. In the present material, the spores are somewhat smaller, ca $3 \times 2 \mu\text{m}$. In all other details the specimens agree with the original description.

Loc. : 1, 3, 5, 8.

Bacidia stipata M. Lamb — The specimens conform well with the description of *B. stipata* (LAMB 1954). Typical stipes are found, but often the thallus is compressed to a more or less undifferentiated spongy mass. It is clearly different from *B. trachona* (see below) in the pale subhymenium and somewhat larger, subvermiform spores (Fig. 1). TLC : negative.

Loc. : 1.

Bacidia trachona (Ach.) Lettau — Thallus forming pulvinate clumps up to 5 mm high, stunted specimens only digitate outgrowths from the rock, ca 1 mm high, pale brown to greyish. Apothecia apical, lecideine, globose, black to brown-black, up to 0,5 mm diam. Excipulum narrow, hyaline. Hypothecium $90\text{--}120 \mu\text{m}$ high, red-brown. Hymenium $50\text{--}65 \mu\text{m}$ high, in the upper part (epithecium) blue-black, otherwise hyaline. Paraphyses simple to moderately branched. Spores 8 in asci, $5 \times 5 \mu\text{m}$, fusiform, $13\text{--}16 \times 2.3$ -septate (Fig. 1). Pycnidia not seen. TLC : negative. Specimens of *Bacidia trachona* from northern Europe have a thallus varying from very thin and smooth to thick and scabrose. The epithecium is green to olivaceous. In all other characters the antarctic and northern European specimens are similar. Apparently new to the Antarctic region.

Loc. : 1.

Buellia foecunda Filson — Spores ca $12 \times 6 \mu\text{m}$, epithecium faintly but distinctly aeruginose, hypothecium pale. This species seems to be common in the continental Antarctic (see ØVSTEDAL 1983).

Loc. : 5.

B. illaetabilis M. Lamb — Epithecium aeruginose, HNO_3^+ red; thallus areolae flat, pale grey, l-. This species has previously been reported from Vestfjella (ØVSTEDAL 1983, LINDSAY 1972). TLC : negative.

Loc. : 1, 3, 5, 10.

B. pycnogonoides Darb. — The prothallus is not as well developed as described

in LAMB (1968). Probably a rare species. TLC : norstictic acid and an unidentified pigment.

Loc. : 2, 5, 10, 11.

? *Buellia* sp. — Thallus crustose, effuse, non-effigurate, up to ca 2 cm diam., composed of ochre to pale green-grey areolae, sterile. Prothallus thin. Soralia white, delimited, concave, 0.5-0.8 mm diam. Pycnidia not seen. TLC : norstictic acid.

The only species described from Antarctica which is similar to this taxon is *Buellia soredians* Filson (FILSON 1974). The holotypus of this species (MEL) was investigated. It consisted of slightly convex, scattered areolae, 0.5-1 mm diam., beige-brown, sorediate. Usually the soralia covered most of the areolae. Soralia brown-black, soredia coarse. Eroded soralia plane to slightly concave. Material too scanty for TLC analysis. The investigated taxon is so different from *B. soredians* that it cannot be concluded that they are conspecific.

Loc. : 5, 8, 9.

Caloplaca citrina (Hoffm.) Th. Fr. — Growing over bryophytes. A common species in the continental Antarctic. Sterile.

Loc. : 5, 6.

Caloplaca jungermanniae (Vahl) Th. Fr. — Apothecia up to 1 mm, usually eroded and then with an almost black surface, but on sheltered places with an ochraceous yellow-brown to yellow-red disc, margin thin, concolorous with disc, not protruding. Spores thin-walled, ca 22 x 12 μm , septa thin, 4-5 μm . Paraphyses with end cell only slightly larger than the other cells, 3-4 μm diam. Excipulum proprium prominent, composed of radiating cells. The specimens has been compared to material of *C. jungermanniae* from Europe, and found to be similar in all essential details. The thallus is very small and almost non-existent, but this may also be the case in north European material. Overgrowing *Bacidia stipata* M. Lamb. It seems that this species has not previously been reported from the Antarctic region.

Loc. : 1.

Candelariella ballettensis (Murray) Øvst. — A common species on bryophytes. Not rare in the continental Antarctic.

Loc. : 1, 6.

Lecanora expectans Darb. — The type of *L. expectans* (BM) has been investigated, and found to be similar in all essential details to the present material. It is also the same species as the material which Filson distributed under this name in his Exsicc. Antarct. The type contains no secondary chemical products, as revealed by TLC. A common species on bryophytes, widespread in the continental Antarctic. TLC : negative.

Loc. : 5, 6.

Lecanora aff. *subfusca* s. lat. — Spores ca $16 \times 6 \mu\text{m}$. On rock. Very scanty material. There seems to be no previous report of any species in the *Lecanora subfusca* group in the Antarctic.

Loc. : 6.

Lecidea s. lat. spp. — There are 3-4 species of *Lecidea* s. lat. in the material. Professor H. Hertel, München, plans to study the Antarctic *Lecidea*, and no attempt has been made here towards a thorough treatment.

Lepraria angardiana Øvst. — This species was recently described from the H.U. Sverdrup mountains, Antarctica (ØVSTEDAL 1984). Growing over dead bryophytes. TLC : atranorin, porphyritic acid and roccellic acid.

Loc. : 1.

«*Lecidea*» *oroantarctica* Øvst. sp. nov.

Fungus lichenicola. Apothecia lecideinea, nigra, nitida, ad 1 mm diam. Excipulum fuscum, ad $40 \mu\text{m}$ latum, textura intricata. Hymenium $50-65 \mu\text{m}$ altum, caerulescens, Γ «reagents» caerulens, ad parte supremus nigro-caerulens; paraphyses flexuosae, ramosae ad anastomosantes, conglutinatae, ca $1 \mu\text{m}$ crassae, cellus extremus amplificatus ad $2.5 \mu\text{m}$, nigro-caerulens; hypothecium ad $140 \mu\text{m}$ crassum, fuscum; asci $26-30 \mu\text{m}$ lati, 8-spore; sporae $12.6 \pm 1.52 \mu\text{m}$ longi, $4.8 \pm 0.75 \mu\text{m}$ crassae, ($n = 14$), incolores, non-septatae.

Holotypus : vide infra.

Apothecia lecideine, black, shiny, up to 1 mm diam. The margin of mature apothecia slightly elevated and the disc usually somewhat convex. Excipulum brown, up to $40 \mu\text{m}$ wide, textura intricata, with long hyphae running parallel to paraphyses. Hymenium $50-65 \mu\text{m}$ high, bluish, in upper part blue-black, thecium reacting Γ blue. Paraphyses flexuose, branched to anastomosing, strongly adglutinated, ca $1 \mu\text{m}$ diam., upper cell(s) slightly enlarged (to $2.5 \mu\text{m}$), blue-black. Hypothecium up to $140 \mu\text{m}$ high, brown. Asci clavate, $26-30 \mu\text{m}$ long, 8-spored. Spores simple, uncoloured $12.6 \pm 1.52 \times 4.8 \pm 0.75 \mu\text{m}$ ($n = 14$). Growing on thalli of *Rhizoplaca melanophthalma*. This taxon keys best out as *Nesolechia cladoniaria* (Nyl.) Arnold in the keys of KEISLER (1930) and VOUAUX (1912-14). However, some specimens of *N. cladoniaria* in UPS have been examined, and found to differ in the smaller size of the apothecia ($0.1-0.15 \text{ mm}$ diam.), which are just protruding from the thallus of the host, very thin excipulum (only 2-3 rows of cells), yellowish hypothecium, very pale Γ blue reaction of the thecium, and different host. In Europe also *N. supersparsa* (Nyl.) Rehm and *N. aggregantula* (Müller) Rehm are found on *Lecanora* s. lat. (*L. polytropia* and *L. subdiscrepans*, R. Santesson in litt.). *N. supersparsa* differs from «*L.*» *oroantarctica* in its spores which have pointed ends, and also uncoloured hypothecium, while *N. aggregantula* differs from «*L.*» *oroantarctica* in its almost globose spores ($8-11 \times 5-7 \mu\text{m}$). Two collections of *Nesolechia koliensis* Räs. (H), growing on *Lecanora frustulosa*, have been examined. They differ from «*L.*» *oroantarctica* in that the apothecia are very small ($0.1-0.2 \text{ mm}$ diam.);

† pale to moderate red thecium; upper part of thecium brown; hypothecium red-(brown); thin, pale excipulum and slightly larger spores (14-17 μm long). According to Santesson (in litt.), «*L.*» *oroantarctica* does not belong to the genus *Nesolechia*. It is apparently associated with a number of species (e. g. *Lecidea atronivea*, *L. vitellinaria*, *L. vorticosa*) which form a distinct group at the rank of genus (HERTEL & ZHAO 1982, HERTEL 1983).

Loc. : Dronning Maud Land, Førstefjell (loc. 2), O. Wilson leg., 3.XI.1951 (UPS) (Holotypus); in addition 3, 5, 6, 9, 10, 12, 13, 14. This species was also found in Vestfjella, and listed as *Lecidea* sp. by ØVSTEDAL (1983).

Neuropogon sulphureus (Koenig) Hellbom — Common in the continental Antarctic. TLC : usnic acid.

Loc. : 1, 6, 7.

Physcia caesia (Hoffm.) Fűrnrrohr — Growing over bryophytes and lichens.

Loc. : 1, 6, 7.

Pseudephebe minuscula (Ach. ex Nyl.) Brodo et D. Hawksw. — Common in the continental Antarctic. TLC : negative.

Loc. : 1, 6.

Rhizocarpon adarens (Darb.) M. Lamb — Apparently a rare species. TLC : rhizocarpic acid.

Loc. : 1, 8.

Rhizocarpon geographicum (L.) DC. — In the key to European *Rhizocarpon* in POELT (1969), the specimens key out either as *R. atroflavescens* Lynge (with 1-4 transverse septa, and occasional 1 longitudinal septum), or *R. geographicum* (L.) DC. (with wall-formed septation of the spores, 6-8-10 cells seen overall). The holotypus of *R. atroflavescens* (O) was examined, and showed 2 to 3 transverse and 0 to 1 longitudinal septa. The number of cells seen overall was 4.0. The specimens from the Wilson collection had 2 to 5 transverse and 1 to 3 longitudinal septa. The mean number of cells seen overall was 5.9. Even if HERTEL (1981) found a somewhat higher value of cells in spores of *R. atroflavescens*, the Wilson specimens are at present best placed in *R. geographicum*. However, typical *R. geographicum* from N Europe has a higher number of cells in the spores.

DODGE (1973) lists 3 yellow *Rhizocarpon* from the Antarctic : *R. melanostichum* (Hue) Darb., *R. nidificum* (Hue) Darb. and *R. flavum* Dodge et Baker. They are mainly distinguished by the height of the thecium and the size of the spores. The height of the thecium is usually quite variable in a population and generally not regarded as a reliable character, while more importance may be attributed to spore size. The types of the three last-mentioned species were not obtainable. TLC : rhizocarpic acid.

Loc. : 3, 5, 10.

Rhizoplaca melanophthalma (Lam.) Leuck. et Poelt — A common species in the Antarctic. TLC : usnic acid and zeorin.

Loc. : 2, 3, 5, 6, 9, 10, 12, 13, 14.

Umbilicaria decussata (Vill.) Frey — Common in the Antarctic.

Loc. : 1, 5, 6, 7, 14.

U. aprina Nyl. — Common in the continental Antarctic.

Loc. : 1, 6, 7.

Xanthoria candelaria (L.) Th. Fr. — A common species in the Antarctic.

Loc. : 5, 6.

X. elegans (Link) Th. Fr. — Probably the most common lichen in the continental Antarctic.

Loc. : 1, 6, 7, 9, 14.

DISCUSSION

The present account includes 24 species plus 3-4 *Lecidea s. lat. spp.* This is about the same number of species which were found by ØVSTEDAL (1983, 1984) in Vestfjella and H.U. Sverdrupfjella, west of the present group of ridges. Altogether in these mountain groups, 30 species plus 6-7 *Lecidea spp.* have been collected. With the present collection, another two species are recognized as bipolar, viz. *Bacidia trachona* and *Caloplaca jungermanniae*. *Rhizocarpon adarensense* appears to belong to the continental Antarctic flora (LAMB 1968), while *Bacidia stipata* appears to occur both in the continental and maritime (subantarctic) Antarctica (LAMB 1954).

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