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47

# Australian Collection of Antarctic Microorganisms: a catalogue of strains, 1987

P.D. Franzmann, D.E. Cameron, T.A. McMeekin, H.R. Burton

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# AUSTRALIAN COLLECTION OF ANTARCTIC MICROORGANISMS: A CATALOGUE OF STRAINS, 1987

by

P.D. Franzmann, D.E. Cameron, T.A. McMeekin
Department of Agricultural Science
University of Tasmania
Hobart, Tasmania, Australia

and

H.R. Burton
Antarctic Division
Department of Science
Kingston, Tasmania, Australia

## ABSTRACT

Details of the Australian Collection of Antarctic Microorganisms, housed at the University of Tasmania, are presented, including a catalogue of ninety-eight strains isolated from the Antarctic continent, subantarctic islands and the Southern Ocean.

## 1. INTRODUCTION

The Australian Collection of Antarctic Microorganisms (ACAM) was commenced on 3 February 1986 and is housed at the University of Tasmania. It is affiliated with the Australian Federation of Culture Collections and the World Federation of Culture Collections (WFCC). The World Data Center for Microorganisms has assigned ACAM the collection number 571 (Staines et al. 1986). ACAM is funded by the Australian Research Grants Scheme, the University of Tasmania and the Antarctic Division. It was established as a collection for Antarctic microorganisms and accepts strains isolated from the Antarctic continent, subantarctic islands and the Southern Ocean. It will hold reference strains from other geographical locations if their use is applicable to Antarctic studies.

ACAM will deposit cultures which are Type strains of newly described species or are new strains of known species which possess attributes of special interest. The strains should have been (or are soon to be) documented in the literature. Prior to culture deposition, workers should write to the curator to give relevant details. At the time of deposition, the depositor must supply a completed WFCC form SCC-4 which is available from ACAM or from the Australian Federation of Culture Collections.

Strains held at ACAM are available to any researcher on payment of a fee to cover handling and postage costs. The current handling cost is $40 per culture. Cultures will be freely exchanged with other collections. Cultures may be deposited in the collection for 'safe storage' from which the culture will only be made available to the depositor but special arrangements must be made with the curator for this service.

Cultures will be stored in a freeze-dried state in most cases. Some strains which do not survive lyophilisation will be stored in ampoules under liquid nitrogen, or will be routinely subcultured. Ampoules of lyophilised material are under vacuum and should be opened with care. The dried material should be resuspended in 0.2 mL of sterile distilled water and subcultured into a suitable solid and liquid medium. Media and growth conditions for each culture are listed in the catalogue.

Forty-six of the ninety-eight strains remain unidentified even to the genus level. Taxonomic studies are being conducted on groups of these strains to identify or characterise them as new taxa. ACAM 1, ACAM 2 and ACAM 40 through 62 are all orange or yellow, Gram-negative, non-motile rods. Given current taxonomic trends, it seems inappropriate to lump them into the genus Flavobacterium and their designation within ACAM awaits further enquiry. A future edition of the catalogue will be able to name the majority of strains held within the collection. It was felt that at this early stage in the development of the collection it was appropriate to publish a catalogue based on the identities as known now so that researchers would learn of ACAM'S existence and how the collection could serve their needs.

## 2. CATALOGUE

The catalogue has three sections:

1. Solutions and media
2. List of cultures
3. References

The solutions and media section details the recipes and methods for the preparation of media required for the cultivation of all the strains listed in the catalogue.

The list of cultures gives details of each culture held at the collection. Cultures are listed alphabetically by genus and species names and are listed in order of accession within each species. The details given for each strain are:

1. Generic and specific epithets
2. Accession number
3. Depositor's name and affiliation at the time of deposition
4. Place and date of isolation
5. Growth method which includes medium, temperature and incubation environment
6. Preservation methods and preservation suspending medium
7. A reference to other collection accession numbers if the strain is held elsewhere. UQM denotes cultures held at the Department of Microbiology, University of Queensland, St. Lucia 4067, Queensland, Australia. ATCC denotes cultures held at the American Type Culture Collection, 12301 Parklawn Drive, Rockville, Maryland 20852, USA.
8. Special features of the strain (if any)
9. References in the literature (if any)

## 3. MEDIA LIST

Unless otherwise stated all solutions and media are sterilised at 121°C for 15 minutes.

### Solutions

S1. Metals 44 (M 44) (Staley 1981)

| | |
|---|---|
| EDTA (Ethylenediaminetetraacetic acid) | 2.5 g |
| $ZnSO_4.7H_2O$ | 10.95 g |
| $FeSO_4.7H_2O$ | 5.0 g |
| $MnSO_4.H_2O$ | 1.54 g |
| $CuSO_4.5H_2O$ | 0.392 g |
| $CoCl_2.6H_2O$ | 0.203 g |
| $Na_2B_4O_7.10H_2O$ | 0.177 g |
| Deionised water to final volume | 1.0 L |

Acidify 500 mL of deionised water with a few drops of $H_2SO_4$. Dissolve the ingredients and make up to volume with deionised water.

S2. Hutner's modified salts solution (HMSS) (Staley 1981)

| | |
|---|---|
| Nitrilotriacetic acid | 10.0 g |
| $MgSO_4.7H_2O$ | 29.7 g |
| $CaCl_2.2H_2O$ | 3.3 g |
| $NaMoO_4.2H_2O$ | 12.7 mg |
| $FeSO_4.H_2O$ | 99.0 mg |
| Metals 44 (S1) | 50.0 mL |
| Deionised water to final volume | 1.0 L |

Neutralise the nitrilotriacetic acid with KOH. Dissolve the remaining ingredients and adjust the pH to 7.2 with KOH or $H_2SO_4$. Sterilise and store at 4°C.

S3. Phosphate supplement (PS)

| | |
|---|---|
| $K_2HPO_4$ | 2.5 g |
| $KH_2PO_4$ | 2.5 g |
| Deionised water | 1.0 L |

S4. Artificial Organic Lake vitamin solution (AOLV) (Staley 1981)

| | |
|---|---|
| Cyanocobalamin | 0.1 mg |
| Biotin | 2.0 mg |
| Calcium pantothenate | 5.0 mg |
| Folic acid | 2.0 mg |
| Nicotinamide | 5.0 mg |
| Pyridoxine HCl | 10.0 mg |
| Riboflavin | 5.0 mg |

| | |
|---|---|
| Thiamine HCl | 5.0 mg |
| Deionised water to final volume | 1.0 L |

Sterilise by filtration (0.2µm). Store at 4°C.

S5. Artificial Deep Lake vitamin solution (ADLV)

| | |
|---|---|
| Biotin | 0.1 g |
| Cyanocobalamin | 0.1 g |
| Thiamine HCl | 0.1 g |
| Deionised water to final volume | 1.0 L |

Sterilise by filtration (0.2µm). Store at 4°C.

S6. Trace element solution (SL 7) (Biebl and Pfennig 1981)

| | |
|---|---|
| HCl 25% (vol: vol) | 1.0 mL |
| $ZnCl_2$ | 70.0 mg |
| $MnCl_2.4H_2O$ | 100.0 mg |
| $H_3BO_3$ | 60.0 mg |
| $CoCl_2.6H_2O$ | 200.0 mg |
| $CuCl_2.2H_2O$ | 20.0 mg |
| $NiCl_2.6H_2O$ | 20.0 mg |
| $NaMoO_4.2H_2O$ | 40.0 mg |
| Deionised water to final volume | 1.0 L |

Dissolve the ingredients in the deionised water. Store at 4°C.

S7. Cyanocobalamin stock solution (0.001%) (Biebl and Pfennig 1981)

Dissolve 1.0 mg of cyanocobalamin in 100.0 mL of deionised water. Sterilise by filtration (0.2µm). Store at 4°C.

S8. Freeze drying suspension medium for marine organisms (FDSM #1)

Prepare 50 mL of 1/2 strength seawater (25 mL deionised water plus 25 mL raw seawater) and 50 mL of 20% (wt.: vol.) skim milk in distilled water. Sterilise the 1/2 strength seawater at 121°C for 15 minutes and the 20% skim milk at 108°C for 30 minutes. After cooling, combine the solutions.

Media

M1. Artificial Deep Lake vitamin agar (ADLVA)

Basal broth.

| | |
|---|---|
| NaCl | 181.0 g |
| $MgCl_2.6H_2O$ | 75.0 g |

| | |
|---|---|
| $MgSO_4.7H_2O$ | 7.4 g |
| KCl | 7.4 g |
| $CaCl_2.2H_2O$ | 1.0 g |
| Deionised water | 1.0 L |

Adjust the pH to 7.0 and store at 4°C.

Complete medium.

| | |
|---|---|
| Yeast extract | 0.1 g |
| Agar | 1.5 g |
| Basal broth | 100.0 mL |

Combine the ingredients and boil to dissolve the agar. Sterilise and cool to 50°C. Aseptically add 1.0 mL of ADLV (Solution S5) and dispense.

M2. Artificial Deep Lake succinate vitamin agar (ADLSVA)

| | |
|---|---|
| Na succinate | 1.0 g |
| ADLVA (Medium M1) | 100.0 mL |

M3. Artificial Organic Lake peptone agar (AOLPA)

| | |
|---|---|
| Basal medium | |
| Deionised water | 960.0 mL |
| NaCl | 100.0 g |
| $MgCl_2.6H_2O$ | 5.0 g |
| $MgSO_4.7H_2O$ | 9.5 g |
| KCl | 5.0 g |
| $CaCl_2.2H_2O$ | 0.2 g |
| $(NH_4)_2SO_4$ | 0.1 g |
| $KNO_3$ | 0.1 g |
| Peptone | 5.0 g |
| Yeast extract | 1.0 g |
| Agar | 15.0 g |

Dissolve the ingredients, adjust the pH to 7.0 and add the agar. Boil to dissolve the agar. Sterilise then cool to 50°C. Add 20.0 mL of HMSS (Solution S2), 20.0 mL of PS (Solution S3) and 1.0 mL of AOLV (Solution S4).

M4. Rhodospirillaceae agar (RA) (Biebl and Pfennig 1981)

| | |
|---|---|
| Deionised water | 1.0 L |
| $KH_2PO_4$ | 0.5 g |
| $MgSO_4.7H_2O$ | 0.2 g |
| NaCl | 0.4 g |
| $NH_4Cl$ | 0.4 g |
| $CaCl_2.2H_2O$ | 0.05 g |
| Na succinate | 1.0 g |
| Yeast extract | 0.2 g |
| Trace element solution SL 7 (Solution S6) | 1.0 mL |
| Fe-citrate (0.1% aqueous solution) | 5.0 mL |
| Agar | 15.0 g |

Dissolve the ingredients in the order given. Adjust the pH to 6.8. Sterilise then cool to 50°C. Add 1.0 mL of cyanocobalamin solution (Solution S7).

M5. Seawater yeast extract agar (SWYA)

| | |
|---|---|
| Filtered seawater (0.45µm) | 1.0 L |
| Yeast extract | 1.0 g |
| Agar | 15.0 g |

Sterilise without prior pH adjustment.

M6. 1/2 Strength seawater agar (1/2 SWA)

| | |
|---|---|
| Glucose | 1.0 g |
| Na acetate $3H_20$ | 1.0 g |
| Peptone | 1.0 g |
| Yeast extract | 0.1 g |
| Deionised water | 500.0 mL |
| Filtered seawater | 500.0 mL |

Sterilise without prior pH adjustment.

M7. Zobells 2216 agar (ZA) (Zobell 1946)

| | |
|---|---|
| Peptone | 5.0 g |
| Yeast extract | 1.0 g |
| $FePO_4$ | 0.01 g |
| Aged seawater | 1.0 L |

Store the seawater in the dark for at least three weeks before use. Sterilise without prior pH adjustment.

M8. Microcyclus / Spirosoma agar (MSA) (Larkin et al. 1977)

| | |
|---|---|
| Peptone | 1.0 g |
| Yeast extract | 1.0 g |
| Glucose | 1.0 g |
| Agar | 15.0 g |
| Deionised water | 1.0 L |
| Option: NaCl | 15.0 g |

Sterilise without prior pH adjustment. Include 1.5% NaCl for marine isolates.

## 4. LIST OF STRAINS

Acinetobacter sp.

ACAM 136 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E) Depth 11.3 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

Bacillus sp.

ACAM 196 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E) Depth 10.3 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

Flectobacillus glomeratus

ACAM 111 Received from: A.J. McGuire (University of Tasmania). Isolation: Prydz Bay, offshore from Davis Base, Antarctica (68°34.6'S, 77°58'E) surface seawater 1983. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1). McGuire et al. (in press).

ACAM 171 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E) Depth 11.0 m. 17/10/84. Growth: 1/2 SWA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1). UQM 3055 Type strain McGuire et al. (in press).

Halobacterium sp.

ACAM 32 Received from: K. Sanderson (University of Tasmania). Isolation: Deep Lake, Antarctica (68°33.6'S, 78°11.6'E) Sediment-water interface 15/6/84. Growth: ADLSVA Aerobic 30°C. Preservation methods: Lyophilisation (ADLSVA).

ACAM 34 Received from: K. Sanderson (University of Tasmania). Isolation: Deep Lake, Antarctica (68°33.6'S, 78°11.6'E) Sediment-water interface 15/6/84. Growth: ADLSVA Aerobic 30°C. Preservation methods: Lyophilisation (ADLSVA).

Halomonas elongata

ACAM 35 Received from: ATCC. Isolation: Solar Salt Facility Dutch Antilles salt water. Growth: AOLPA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1). ATCC 33173 UQM 2924 Type Strain Vreeland et al. (1980).

Halomonas subglaciescola

ACAM 3 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 7 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 4 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 7 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 5 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 6 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 7 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 8 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 9 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 10 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 11 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 24/10/84. Growth: 30°C AOLPA. Preservation methods: Aerobic Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 12 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). UQM 2926 Type strain Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 13 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 14 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 15 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 7 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 16 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 17 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 18 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 19 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 4 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 20 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 4 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 21 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 4 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). UQM 2927 Reference strain Biotype II Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 22 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 4 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 23 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 24 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 25 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). UQM 2925 Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 26 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 27 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 28 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 6 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 29 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 6 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 30 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 6 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

ACAM 31 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 6 m. 24/10/84. Growth: AOLPA Aerobic 30°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press). Franzmann et al. (1987).

Pseudomonas sp.

ACAM 113 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10 m. 17/8/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 119 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.8 m. 15/9/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 122 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.7 m. 15/9/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 124 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 1.0 m. 15/9/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 125 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 1.0 m. 15/9/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 146 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.2 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 147 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.2 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 148 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 12.0 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 150 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 12.0 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 151 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 12.3 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 159 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.2 m. 17/10/84. Growth: 1/2 SWA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 162 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.8 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 166 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.5 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 188 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.4 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 192 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.4 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

Rhodopseudomonas sp.

ACAM 33 Received from: C. Burke (Antarctic Division). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 9.1 m. 7/11/85. Growth: RA Anaerobic; light 25°C. Preservation methods: Lyophilisation (FDSM #1).

Unidentified

ACAM 1 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 24/10/84. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press).

ACAM 2 Received from: P.D. Franzmann (Antarctic Division). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 24/10/84. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1). Franzmann et al. (in press).

ACAM 40 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 41 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 42 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 43 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 44 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 45 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 46 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 5 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 47 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 4 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 48 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 4 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 49 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 4 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 50 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 51 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 52 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 53 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 54 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 55 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 56 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 57 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 1 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 58 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 1 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 59 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 60 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 61 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 3 m. 1/5/86. Growth: SWYA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 62 Received from: D. Cameron (ACAM). Isolation: Organic Lake, Antarctica (68°27.2'S, 78°12.3'E). Depth 2 m. 1/5/86. Growth: 25°C SWYA . Preservation methods: Aerobic Lyophilisation (FDSM #1).

ACAM 101 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 2 m. 15/5/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 116 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 6 m. 15/5/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 118 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.7 m. 15/9/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 123 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.3 m. 15/9/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 129 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 3.0 m. 15/9/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 139 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.4 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 140 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.4 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 142 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.7 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 143 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.7 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 145 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.2 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 149 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 12.0 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 156 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 12.2 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 167 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.7 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 172 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.0 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 178 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.5 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 179 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.5 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 181 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 11.6 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 207 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 7.0 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 210 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 8.0 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 213 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 10.4 m. 17/10/84. Growth: ZA Aerobic 25°C. Preservation methods: Lyophilisation (FDSM #1).

ACAM 220 Received from: A.J. McGuire (University of Tasmania). Isolation: Burton Lake, Antarctica (68°37.5'S, 78°05'E). Depth 5.0 m. 17/10/84. Growth: ZA Aerobic 15°C. Preservation methods: Lyophilisation (FDSM #1).

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