

Report to the Shackleton Scholarship Fund – January 2018

A preliminary account of diatom taxa in the Falkland Islands

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Summary

The ‘Diatom Flora of the Falkland Islands’ is a collaborative project between the National Museum of Wales, United Kingdom, and the Botanic Garden Meise, Belgium. This report documents 109 diatom taxa in 36 genera found at 111 locations investigated during field surveys in East and West Falkland, on Pebble Island and on Saunders Islands in 2011 and 2015.

Introduction

In 1913, Carlson published his studies on the diatom flora of the southern Atlantic region. These included investigations on the Falkland Islands, South Georgia and Antarctica (Carlson 1913). Kociolek et al. 1995, Fukushima et al. 2001, Flower 2005, Flower et al. 2012 continued floristic and ecological studies from the 1990s onwards. Flower (2005) is to date the most comprehensive study of the Falkland diatom flora. He described eleven new taxa and reported 233 taxa in total, attributing high species diversity to habitat complexity, water chemistry, climatic condition, geographical location and isolation. From 2011 onwards, new surveys of the cryptogamic flora (lichens and bryophytes) were conducted on the Falkland Islands (funded by the United Kingdom Government under DEFRA and the Darwin Initiative, grant no. DPLUS017). During these investigations diatom samples were taken as opportunities arose, subsequently extended by a larger diatom survey in 2015 funded by the

Shackleton Fund. These collections, held at the diatom collection of the National Museum of Wales (NMW), form the basis of this study.

The ‘Diatom Flora of the Falkland Islands’ is now a long-term project between the National Museum of Wales, United Kingdom, and the Botanic Garden Meise, Belgium, with the aim to publish a book in the series ‘Iconographia Diatomologica’. The study of the Falkland Island diatom flora is also part of investigations in a wider geographical area, in particular on islands in sub-Antarctic regions, Antarctica and southern parts of South America, conducted by Bart Van de Vijver. This report reflects the state of our current knowledge. Fifty species were identified to species level, but others are subject to further investigations. The species documented in light microscopy below are the most common species encountered during field surveys conducted in 2011 and 2015, but represent only a subset of all species in our current collection from the Falkland Islands.

At present we have recorded and photographed 109 taxa in 36 genera. The most species-rich genera were *Pinnularia* Ehrenberg (19) and *Eunotia* Ehrenberg (15). Species in these genera are common in low pH freshwaters and reflect the abundance of these habitats in the Falkland Islands. Other genera (number of species, subspecies or forma) found included *Psammothidium* (8), *Nitzschia* (7), *Gomphonema* (5), *Fragilaria* (4), *Planothidium* (4), *Distrionella* (2, 1), *Luticola* (3), *Navicula* (3), *Fragilariforma* (1, 1), *Staurosira* (2), *Achnantheidium* (2), *Encyonema* (2), *Humidophila* (2), *Diploneis* (2), *Caloneis* (2), *Stauroneis* (2), *Chamaepinnularia* (2), *Neidium* (2), *Frustulia* (2), *Surirella* (2), *Stauroforma* (1), *Staurosirella* (1), *Ctenophora* (1), *Platessa* (1), *Cocconeis* (1), *Achnanthes* (1), *Halamphora* (1), *Brachysira* (1), *Lecohuia* (1), *Pinnunavis* (1), *Microcostatus* (1), *Veigaludwigia* (1), *Sellaphora* (1) and *Epithemia* (1).

Detailed investigations of the genus *Eunotia* led to the submission of a manuscript: ‘Jüttner I., Van de Vijver B., Williams D.M., Lange-Bertalot H. & Ector L. A preliminary account of the species in the genus *Eunotia* (Bacillariophyta) in the Falkland Islands and species-area relationships in sub-Antarctic islands’ to the journal *Diatom Research* in December 2017. A revision of the species in the genus *Pinnularia* has started and will continue in 2018/19.

Materials and Methods

Field surveys in the Falkland Islands were conducted in January 2011, January and February 2015, and (Shackleton-funded) in November 2015. A total of 111 sites were investigated. In 2011 and early 2015 samples were collected as opportunities arose during a lichen survey. In late 2015 more effort was made during a diatom survey, funded by the Shackleton Scholarship Fund, to cover a geographical area as wide as possible, although upland areas and islands without grazing were not visited (Fig. 1). Investigated habitats included streams, small lakes, ponds, pools, seepages, springs and damp terrestrial habitats such as moss, soil, sand and peat. Epilithic diatoms were collected by removing the biofilm on stones using toothbrushes. Diatoms growing on bryophytes were collected by removing parts of the plant; diatoms growing on soil, peat, sand or submerged sediments were sampled by removing the upper layer of the substratum with a knife or by sliding a tube across the surface of the sediment.

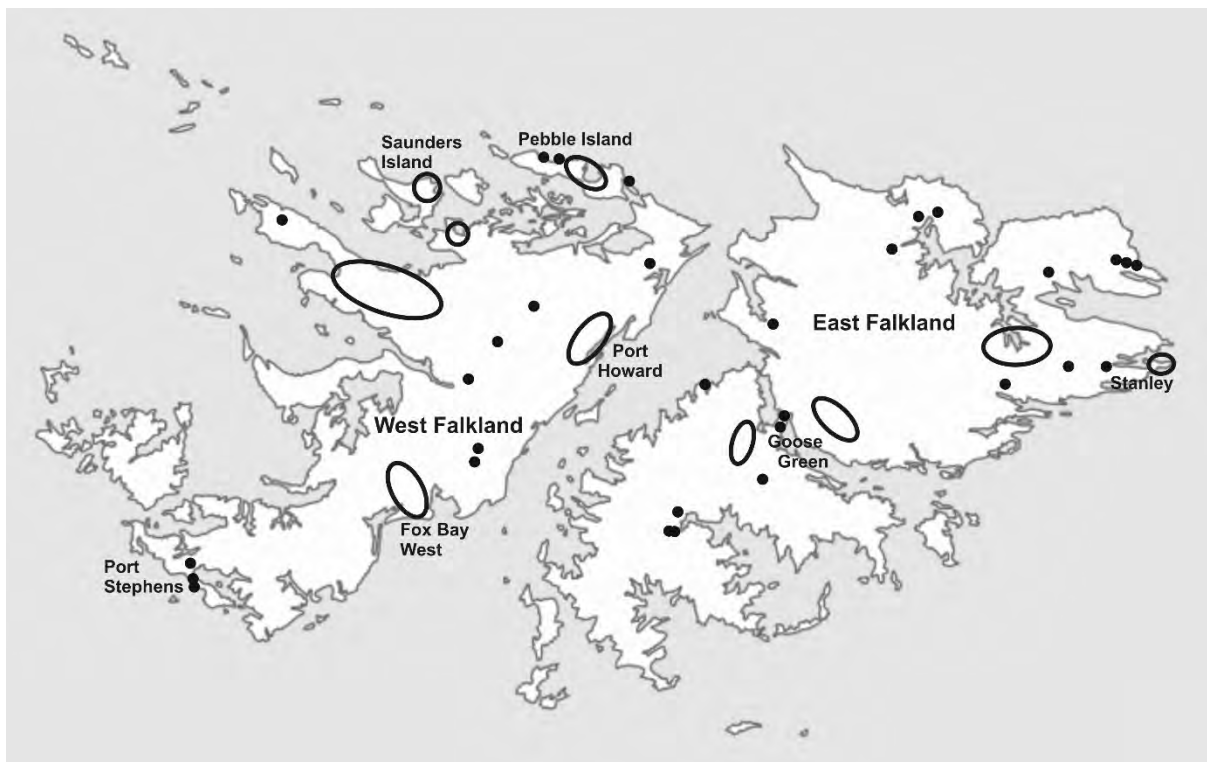


Fig.1. Study areas in the Falkland Islands.

Samples were processed using hot hydrogen peroxide (H₂O₂) oxidation and permanent slides were made using the mountant Naphrax®. The slides were analysed using a Nikon E600 microscope (100× oil immersion objective, National Museum Cardiff, Wales), equipped with differential interference contrast (Nomarski). Images were taken using a Nikon Imaging Source 5 Megapixel CMOS Color Camera and the NIS-Elements D Software. For scanning electron microscopy (SEM) parts of the oxidized suspensions were filtered through a 1-µm Isopore™ polycarbonate membrane filter (Merck Millipore). Parts of the filter were mounted on stubs and sputter-coated with a platinum layer of 2 nm and studied in a JEOL JSM-7100F SEM microscope at 1 kV (Botanic Garden Meise, Belgium).

Terminology largely follows Anonymous (1975) and Ross et al. (1979). Herbarium abbreviations follow *Index Herbariorum: A Global Directory of Public Herbaria and Associated Staff* (<http://sciweb.nybg.org/science2/IndexHerbariorum.asp>).

Species names are followed by the authority, and in some cases ‘References’ mention additional publications which feature the species in question. ‘Material examined’ refers to the accession number for slides and material in the diatom collection of the National Museum of Wales. All samples are accessioned in the diatom database of the National Museum of Wales using the software Filemaker Pro 15.

Observations

Taxonomic treatments

Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Fragilariophycidae
Order Fragilariales
Family Fragilariaceae

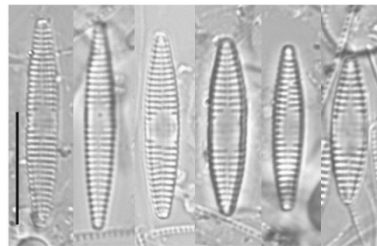
Genus *Fragilaria*

Fragilaria cf. *famelica* (Kütz.) Lange-Bert.
(1980, p.749, pl.6, figs 147–150)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.91



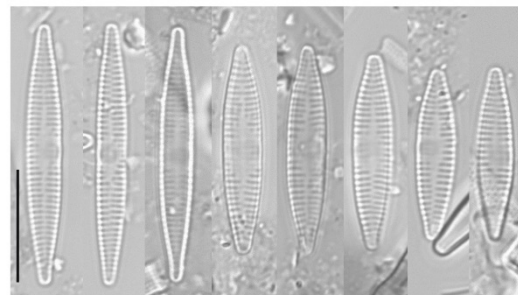
Fragilaria cf. *rumpens* (Kütz.) Carlson
(1913, p.29, pl.2, figs 17, 18)

References: Tuji & Williams
2006 (p.99, 101, figs 1–18)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.11



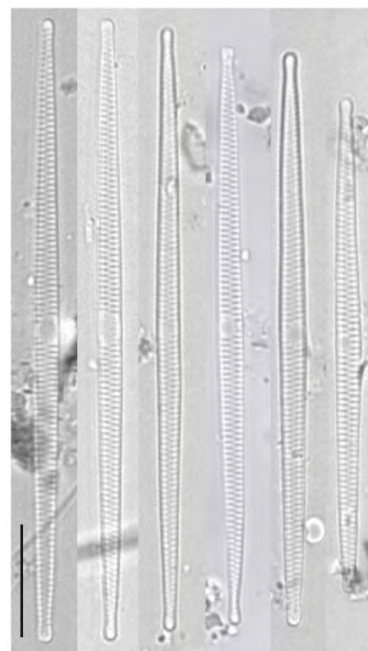
Fragilaria cf. *tenera* (W.Smith) Lange-Bert.
(1980, p.746)

References: Lange-Bert. & Ulrich 2014
(p.7, pl.1, figs 1–6)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.26mac



Fragilaria cf. microvaucheriae

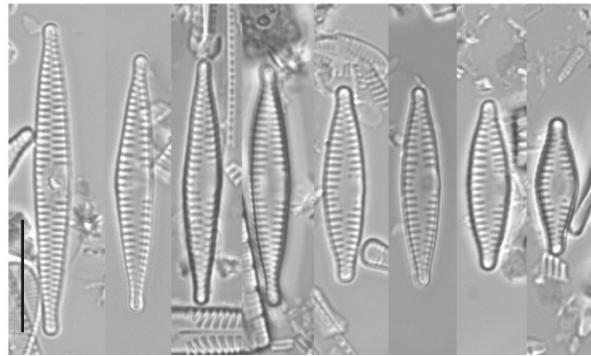
C.E. Wetzel & Ector

(2015, p.282, figs 107–142)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.60



Genus *Fragilariforma*

Fragilariforma lata (Cleve-Euler) Williams & Round (1988, p.266)

Fragilariforma lata* var. *acuta Flower (2005, p.62, fig.46)

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.14

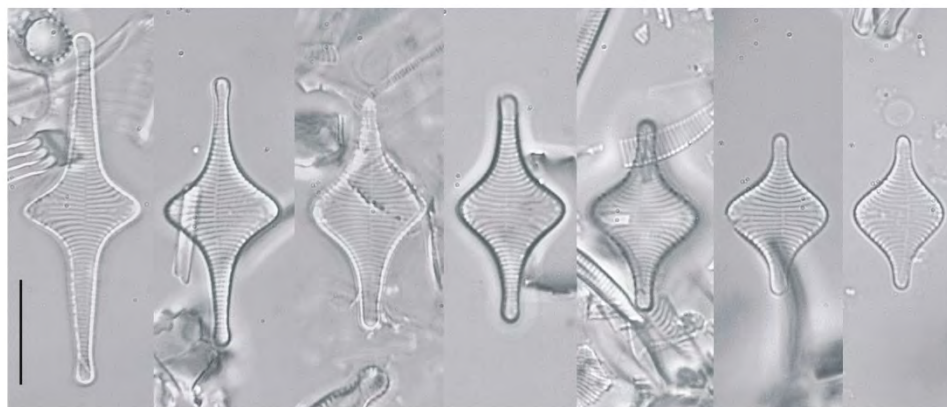
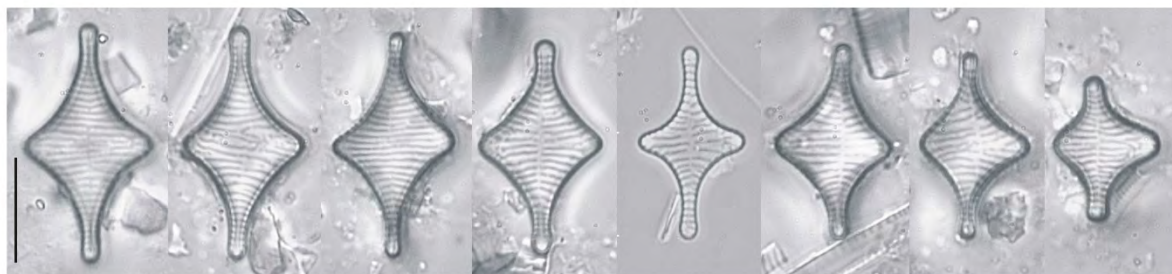
NMW.C.2016.003.Falkland.2015.35soil

Remarks:— Other similar species were described from New Zealand and from Brazil:

Fragilariforma cassieae C. Kilroy & E.A. Bergey (Kilroy et al. 2003, p. 538, 539, fig. 1A-

K), *F. williamsii* Metzeltin & Lange-Bert. (2007, p. 136, pl. 18, figs 1–15) and *F. stevensonii*

Metzeltin & Lange-Bert. (2007, p.135, pl. 19, figs 1–15).



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Fragilariophycidae
Order Fragilariales
Family Staurosiraceae

Genus *Stauroforma*

Stauroforma exiguiformis (Lange-Bert.) R.J.

Flower, V.J. Jones & F.E. Round
(1996, p.53–54)

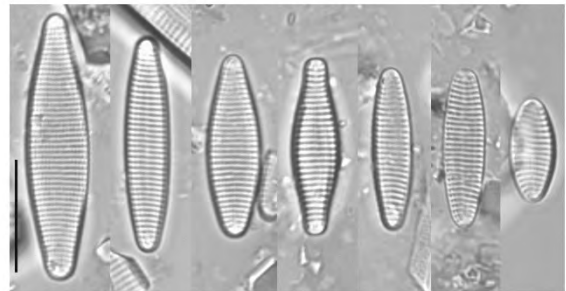
Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.22AO

NMW.C.2016.003.Falkland.2015.75

Remarks:— A similar species *Stauroforma inermis* Flower, Jones & Round (1996, p. 54, figs 23–33) was described from Antarctica.



Genus *Staurosira*

Staurosira proboscoidea Lange-Bert. & Rumrich (Rumrich et al. 2000, p. 226, pl.10, figs 15–19)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.29mac

Remarks: — A similar species *Staurosira mercedes* Lange-Bert. & Rumrich (Rumrich et al. 2000, p. 224, pl.10, figs 12–14) was described from Nicaragua.

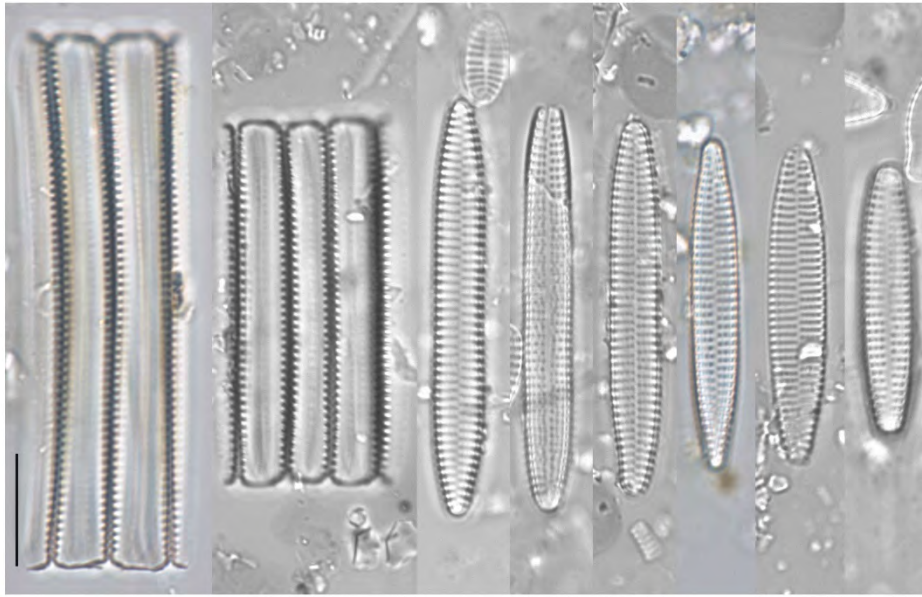


Staurosira cf. neoproducta (Lange-Bert.) Chudaev & Gololobova (2012, p.74, pl.2, figs 2–7, pl.4, figs 1–3)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.1mac

Remarks:— This species is similar to *Staurosira alpestris* (Krasske) Van de Vijver (Van de Vijver et al. 2002, p.114, pl.14, figs 1–14) found on the Kerguelen and South Shetland Islands, and to *Staurosira pottiezii* Van de Vijver (Van de Vijver et al. 2014, p.257, 258, figs 1–25) described from Livingston Island, South Shetland Islands.



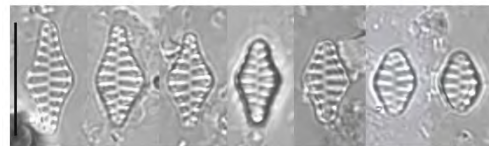
Genus *Staurosirella*

***Staurosirella* sp.1**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.29mac



Division Bacillariophyta
 Subdivision Bacillariophytina
 Class Bacillariophyceae
 Subclass Fragilariophycidae
 Order Tabellariales
 Family Tabellariaceae

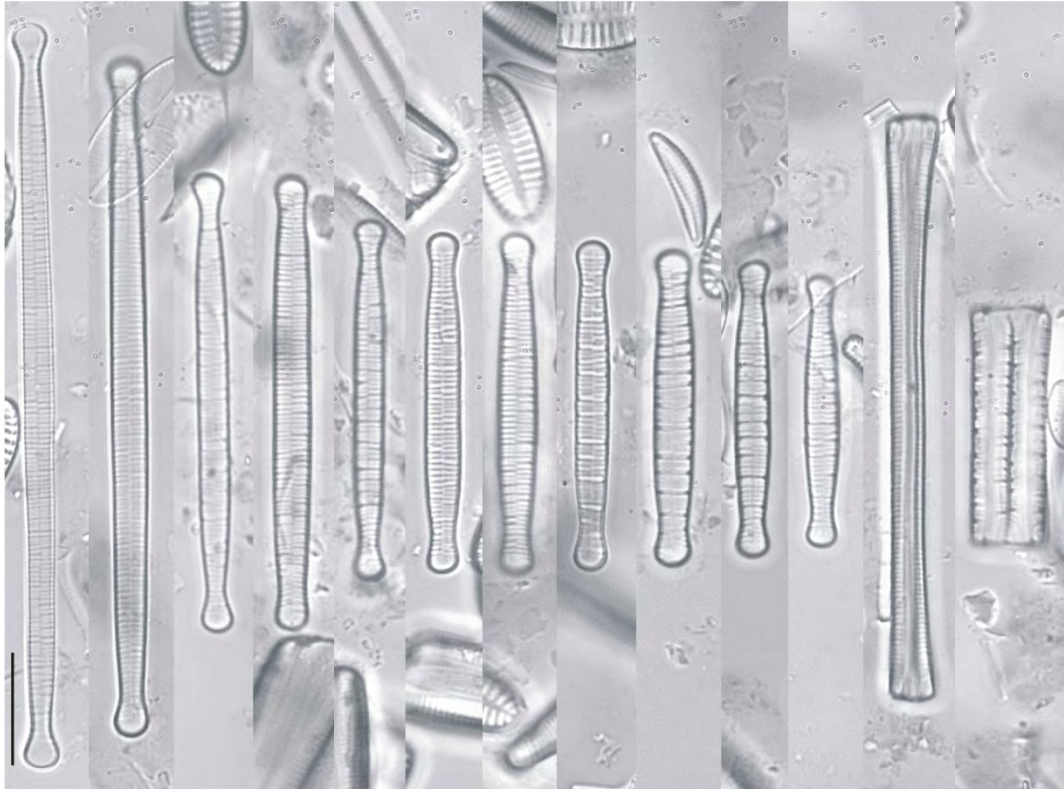
Genus *Distrionella*

Distrionella germainii (Reichardt & Lange-Bert.) E. Morales, Bahls & Cody (2005, p. 131, 132)

Basionym: *Fragilaria germainii* Reichardt & Lange-Bert. 1990 (p.204, pl.1, figs 1-13)

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.5bryo

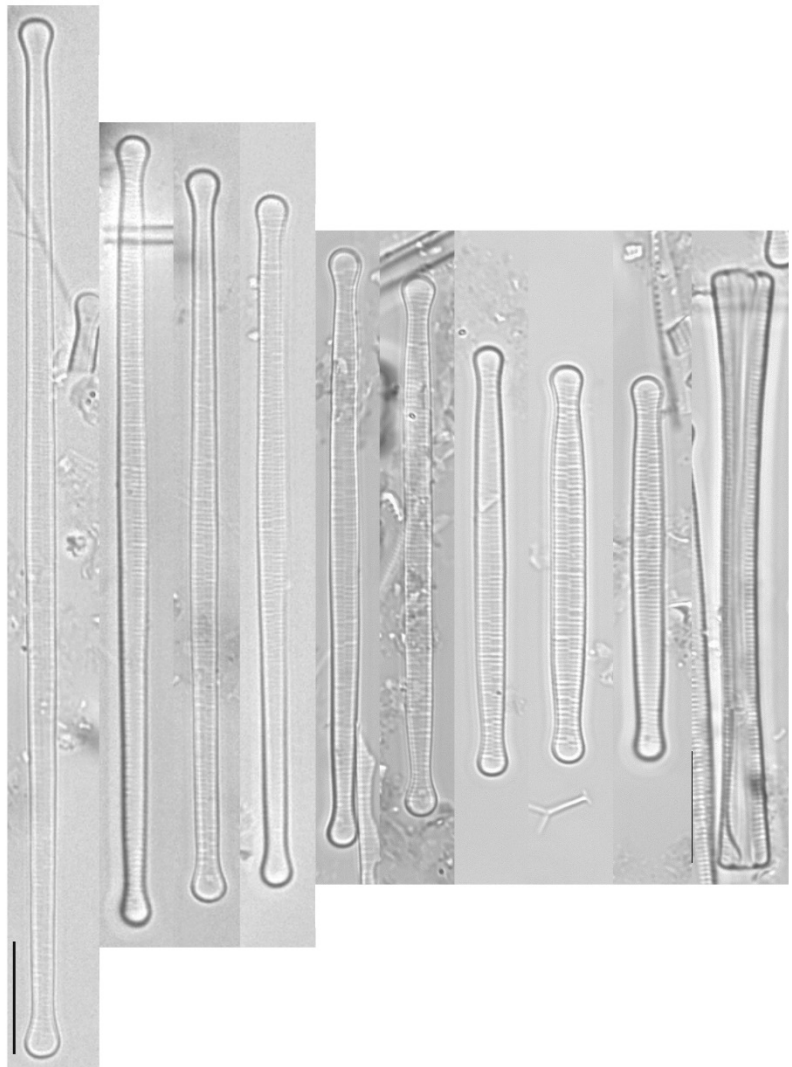


Ditrionella germainii f.
acostata (Lange-Bert.) E.
Morales, Bahls & Cody (2005,
p.133)

Material examined:

FALKLAND ISLANDS:
NMW.C.2016.003.Falkland.20
15.66

Remarks: Described as a new
form from the lake area
Laguna Verde, Chile (Lange-
Bert. in Rumrich et al. 2000, p.
127, pl.5, figs 15–20).



Distrionella husvikensis (Van de Vijver, Denys & Beyens)
E. Morales, Bahls & Cody (2005, p.132)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.5bryo

Remarks:— *D. husvikensis* was
described from South Georgia
(Van de Vijver et al. 2000, p. 538, figs 1–62).

Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Fragilariophycidae
Order Licmophorales
Family Ulnariaceae

Genus *Ctenophora*

***Ctenophora* sp.1**

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.11



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass: Eunotiophycidae
Order Eunotiales
Family Eunotiaceae

Genus *Eunotia* (remark: this list is preliminary and currently subject to review)

Eunotia andinofrequens Lange-Bert. & Rumrich (Rumrich et al. 2000, p. 120, 121, figs 18–24)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.88.AO

Eunotia australovalida Jüttner & Van de Vijver, manuscript name

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.21expbryo

NMW.C.2016.003.Falkland.2015.21bryo.mac

Eunotia exigua (Brébisson ex Kütz.) Rabenhorst (1864: 73)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.68.AO

NMW.C.2011.040.Falkland.2011.38expbryo, NMW.C.2011.040.Falkland.2011.17

Eunotia floweriana Van de Vijver & Jüttner, manuscript name

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.7;

NMW.C.2011.040.Falkland.2011.8; NMW.C.2016.003.Falkland.2015.14filalg.mac

Eunotia implicata Nörpel, Alles, & Lange-Bert. (1991: 206, pl. 7, figs 19-32)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.25bryo

Eunotia incisa W.Smith ex Gregory (1854: 96, pl.4, fig. 4)

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.14;

NMW.C.2016.003.Falkland.2015.21sed

NMW.C.2011.040.Falkland.2011.17; NMW.C.2011.040.Falkland.2011.21B

NMW.C.2016.003.Falkland.2015.68.AO

Eunotia inconspicua Van de Vijver & Jüttner, manuscript name

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.17

NMW.C.2011.040.Falkland.2011.21B

Eunotia latecapitata Jüttner & Van de Vijver, manuscript name

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.21B

Eunotia cf. muscicola Krasske (reported as *E. muscicola* Krasske in Van de Vijver et al. 2014, fig. 2 AU–BH)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.13soil,
NMW.C.2016.003.Falkland.2015.47

Eunotia problematica Kulikovskiy, Lange-Bert., Genkal & Witkowski (2010b, p. 99–101, fig. 6, 1–23)

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.11

Eunotia pseudopaludosa Van de Vijver et al. (2014, p. 174, pl. 12, figs A–Z)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.35soil

Eunotia schwabei Krasske (1939, p.366, pl.10, figs 24, 25)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.35soil

Eunotia subarcuatoides Alles, Nörpel & Lange-Bert. (1991, p.188, pl. 4, figs 1–36)

Material examined:

FALKLAND ISLANDS: NMW.C. 2016.003.Falkland.2015.47

Eunotia tenuivalva Simonsen (1987, p.41, pl.41, figs 6–8)

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.8,
NMW.C.2016.003.Falkland.2015.35soil

Eunotia ursamaioris Lange-Bert. & Nörpel-Schempp (Lange-Bert. & Genkal 1999, p. 48, 49, pl. 4, fig. 21)

References: Lange-Bert. et al. 2011 (p. 237, pl. 152, figs 22–27)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.68.AO

Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Cocconeidales
Family Achnanthidiaceae

Genus *Achnanthidium*

Achnanthidium modestiforme (Lange-Bert.) Van de Vijver (Van de Vijver et al. 2002; 17)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO

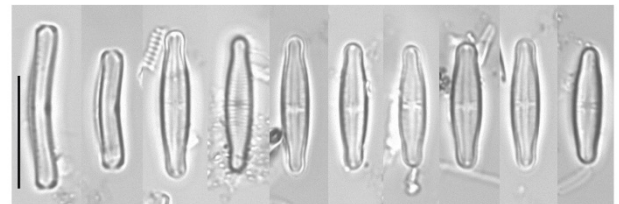


Achnanthidium indistinctum Van de Vijver & Kopalová (2014, p.4, figs 2–28)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.10



Genus *Planothidium*

Planothidium aueri (Krasske)
Lange-Bert. (Lange-Bert. 1999, p.281)

References: Krasske 1949
(p.79, fig.3)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO

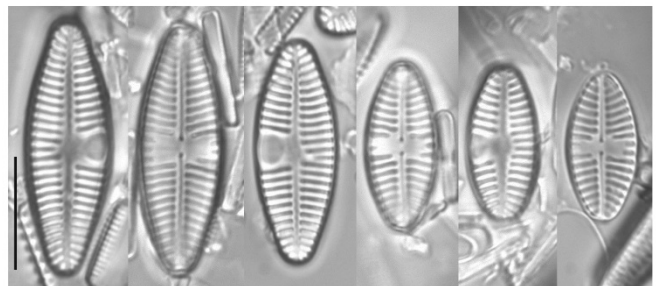


Planothidium subantarcticum Van der Vijver & Wetzel (Van de Vijver et al. 2013, p.111, figs 85–107, 115–121)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.4bryo



***Planothidium cf. pericavum* (Carter)**

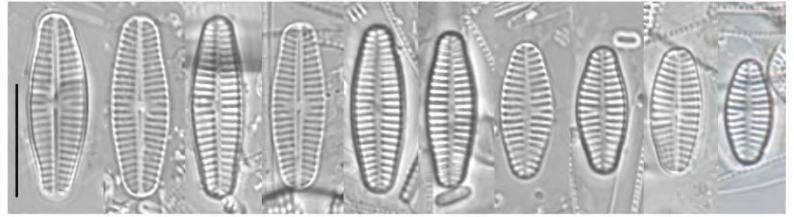
Lange-Bert. (1999, p.284;

References: Carter 1966 (p.447, pl.1, figs 5–8)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.91



***Planothidium renei* (Lange-Bert. & Rol. Schmidt)**

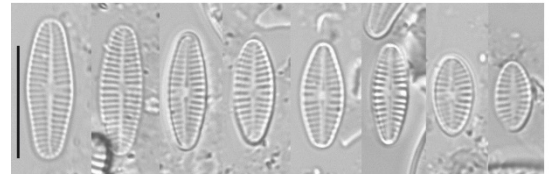
Van de Vijver (Vijver et al. 2002, p.102)

References: Schmidt et al. 1990 (p.64–65, figs 6o–t)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.16B



Genus *Platessa*

***Platessa oblongella* (Østrup) C.E.Wetzel, Lange-Bert. & Ector (Wetzel et al. 2017, p.213)**

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.5bryo



Genus *Psammothidium*

***Psammothidium confusum* (Manguin) Van de Vijver**

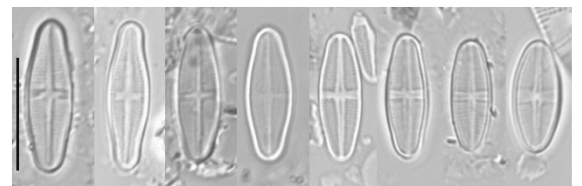
(Van de Vijver et al. 2002, p.103, pl.31, figs 14–22)

References: Bourrelly & Manguin 1954 (p.20, fig.12)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.16B



***Psammothidium incognitum* (Krasske) Van der Vijver**

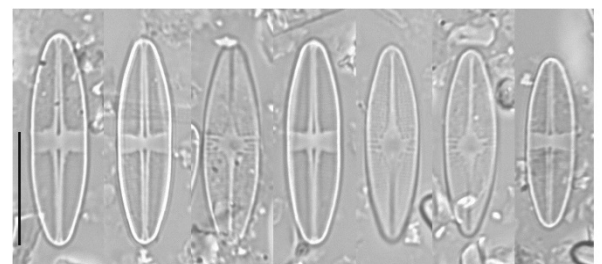
(Van de Vijver et al. 2002, p.105, pl.29, figs 1–11)

References: Krasske 1939 (p.370, pl.6, figs 1, 2)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.45bryo



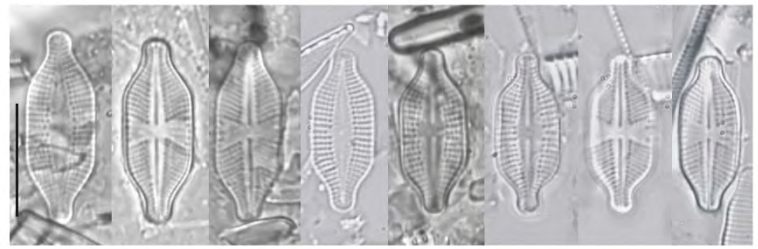
Psammothidium manguinii (Hustedt) Van de Vijver (Van de Vijver et al. 2002, p.106, pl.29, figs 20–33)

References: Hustedt 1952 (p.383, figs 52–56)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO

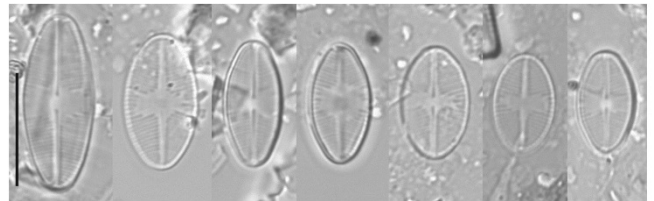


Psammothidium cf. pseudoinvestians Flower (2005, p.64, figs 86–88)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015



***Psammothidium* sp.1**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22sed



***Psammothidium* sp.3**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.70.AO

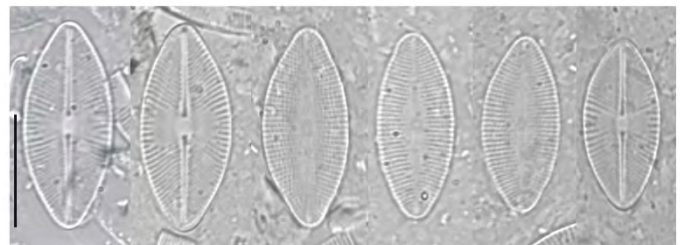


***Psammothidium* sp.4**

Material examined:

FALKLAND ISLANDS:

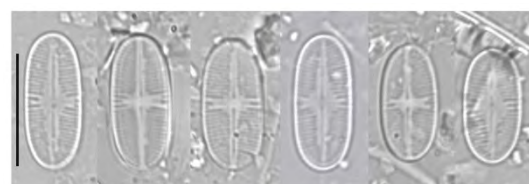
NMW.C.2016.003.Falkland.2015.70.AO



***Psammothidium* sp.6**

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003 Falkland.2015.45bryo



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Cocconeidales
Family Cocconeidacea

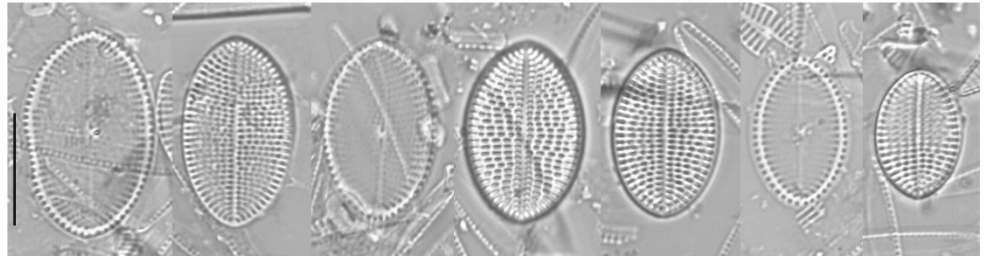
Genus *Cocconeis*

Cocconeis crozetensis

Romero & Van de Vijver
(2011, p.91, figs 2–30)

Material examined:

FALKLAND ISLANDS:
NMW.C.2016.003.
Falkland.2015.91



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Mastogloiales
Family Achnantheaceae

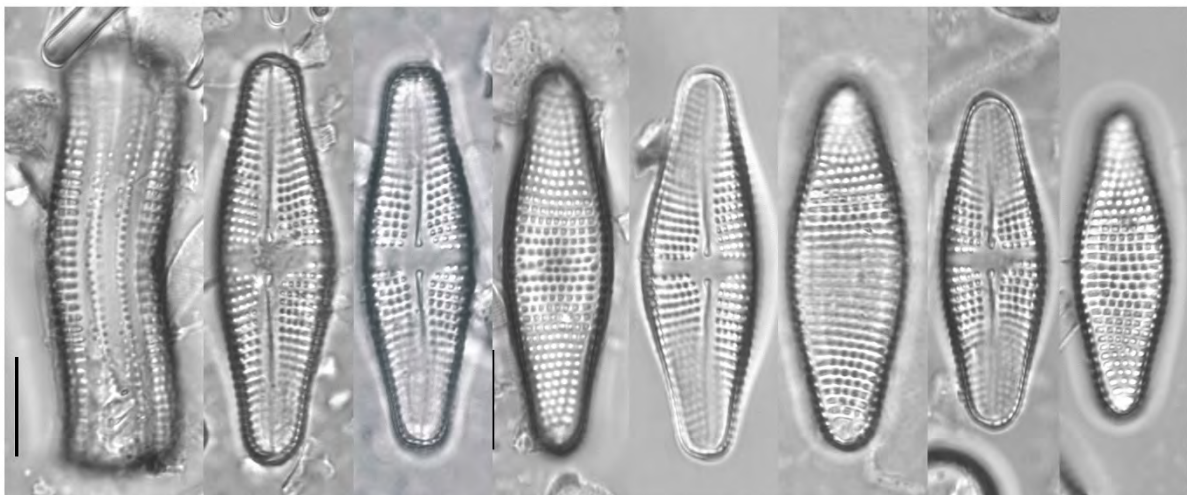
Genus *Achnanthes*

Achnanthes muelleri G.W.F. Carlson (1913, p.23, pl.3, fig 5–7)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.70.AO

Remarks:— This species also occurs in South Georgia and the Kerguelen Islands (Van de Vijver et al. (2002, p.16, pl.19, figs 1–11, pl.20, figs 1–8).



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Thalassiophysales
Family Catenulaceae

Genus *Halamphora*

***Halamphora* sp.1**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Cymbellales
Family Gomphonemataceae

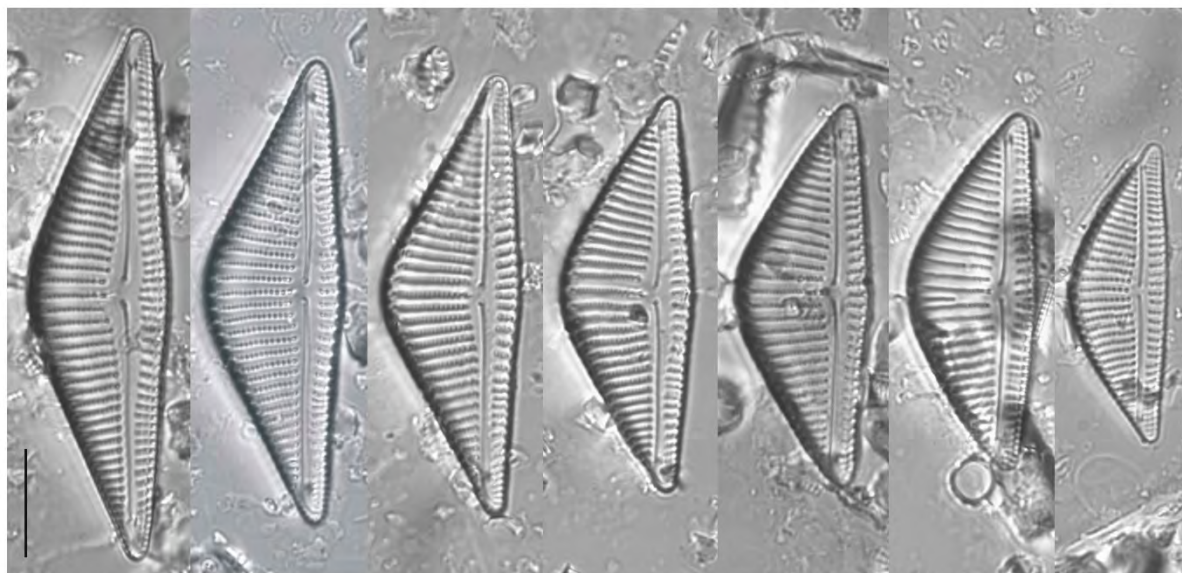
Genus *Encyonema*

Encyonema subelginense (Krammer) D.G.Mann (Round et al. 1990, p.666)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.29mac

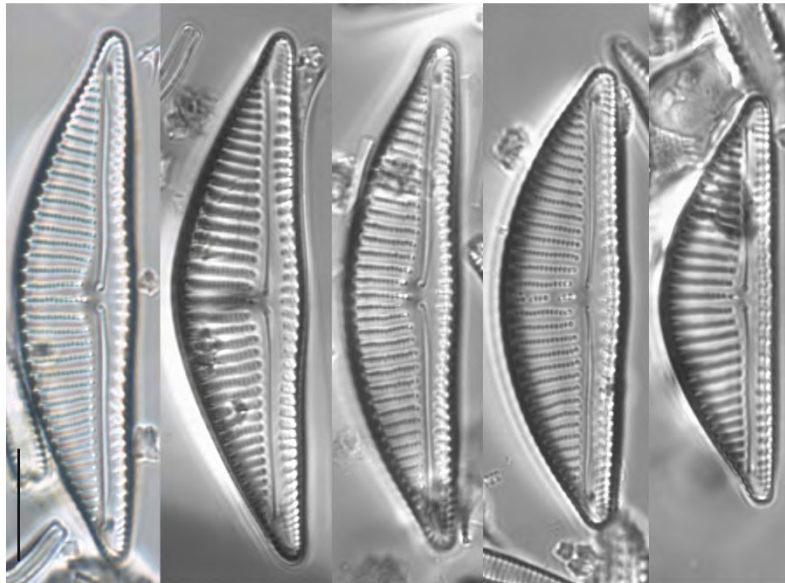
References: Rumrich et al. 2000 (pl.133, p.500)



***Encyonema* sp.**

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.119bryo



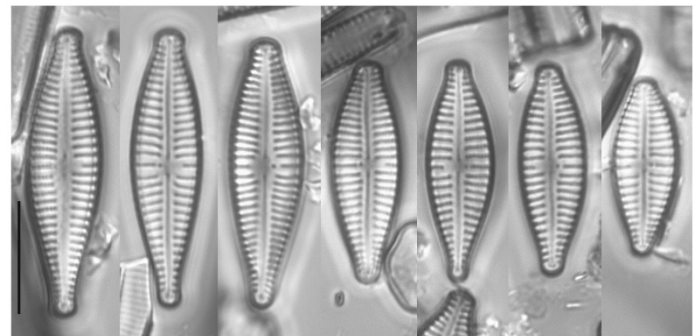
Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Cymbellales
Family Gomphonemataceae

Genus *Gomphonema*

***Gomphonema parvulum* (Kütz.) Kütz.**
(1849, p.65)

Material examined:

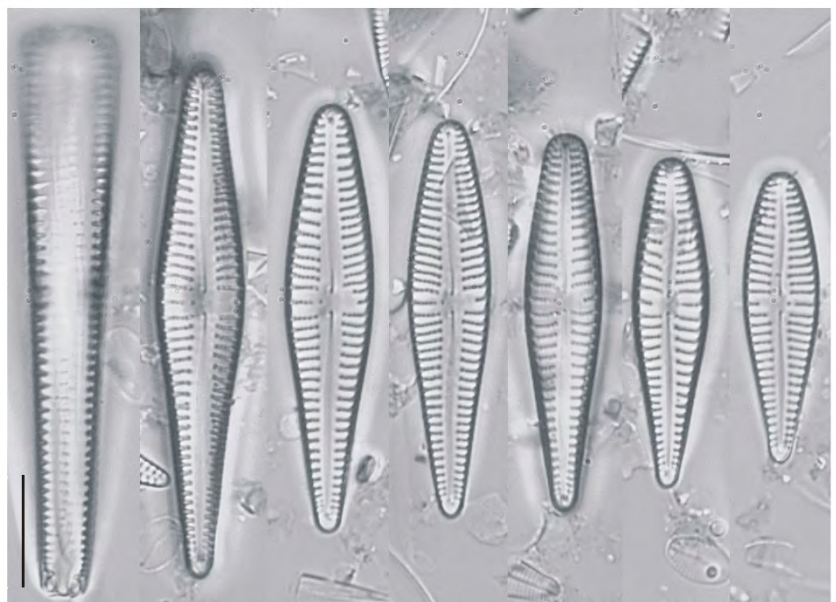
FALKLAND ISLANDS:
NMW.C.2011.040.Falkland.2011.20



***Gomphonema* sp.1**

Material examined:

FALKLAND ISLANDS:
NMW.C.2016.003.Falkland.2015.22.
AO



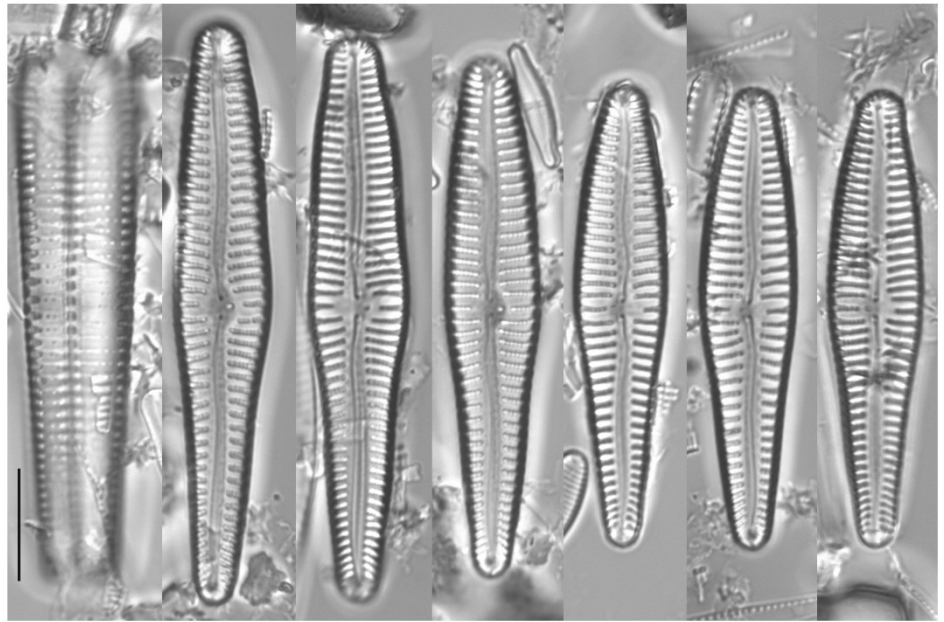
Gomphonema subclavatum

(Grunow) Grunow (1884,
p.46 [98], pl.1, fig.13)

References: Levkov et al.
2016 (p.123, 124, pl.64, figs
1–19)

Material examined:

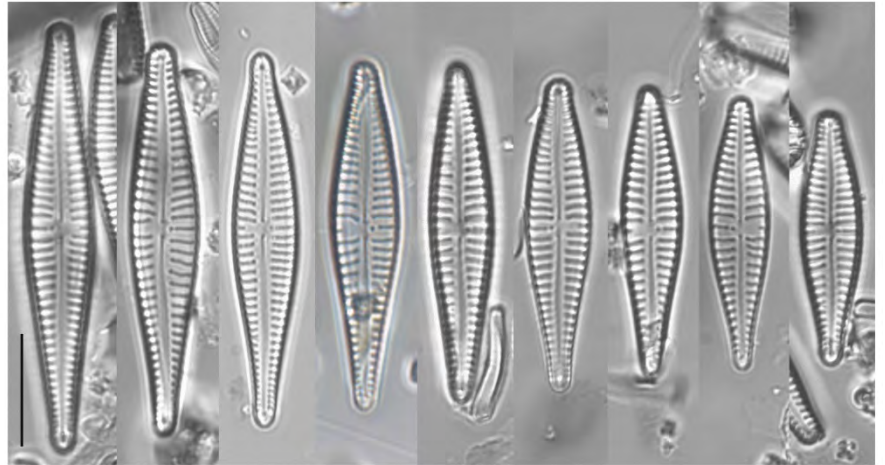
FALKLAND ISLANDS:
NMW.C.2016.003.Falkland.2
015.60



***Gomphonema* sp.3**

Material examined:

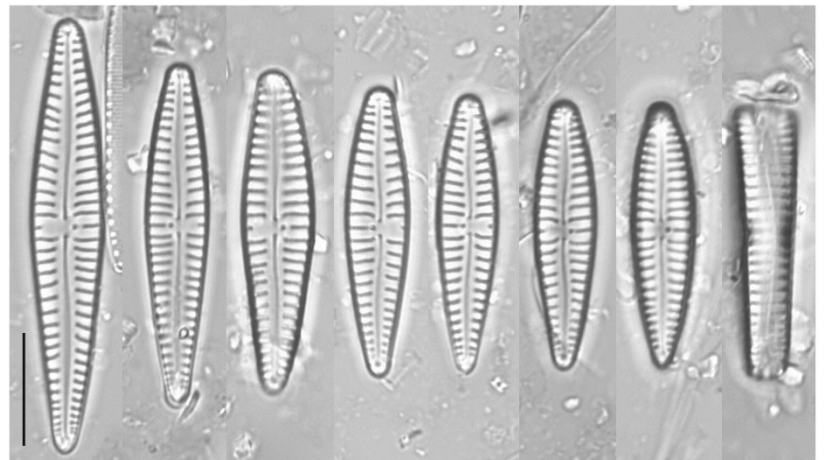
FALKLAND ISLANDS:
NMW.C.2016.003.Falkland.20
15.119bryo



***Gomphonema* sp.4**

Material examined:

FALKLAND ISLANDS:
NMW.C.2016.003.Falkland.2015.
64.AO



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Brachysiraceae

Genus *Brachysira*

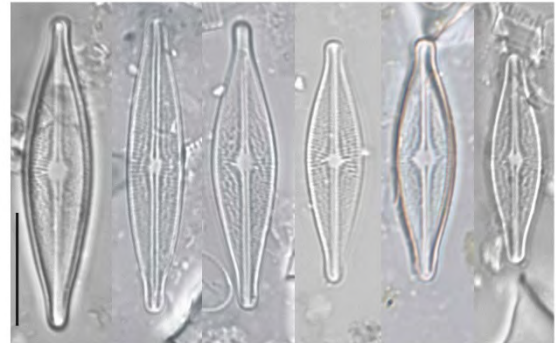
Brachysira microcephala (Grunow) Compère
(Compère 1986; p.26–28, fig. 94)

References: Kennedy & Allot 2017 (p.17–21,
Figs 136–252)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.76



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Diadesmidaceae

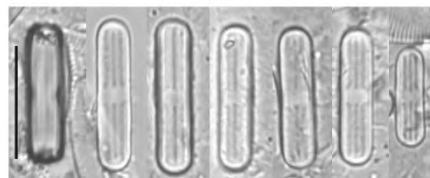
Genus *Humidophila*

***Humidophila* sp.1**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.70.AO



Humidophila nienta (Carter) Lowe, Kociolek, Johansen,
Van de Vijver, Lange-Bert. & Kopalová (Lowe et al.
2014, p.3, figs 11–17)

Material examined:

FALKLAND ISLANDS:

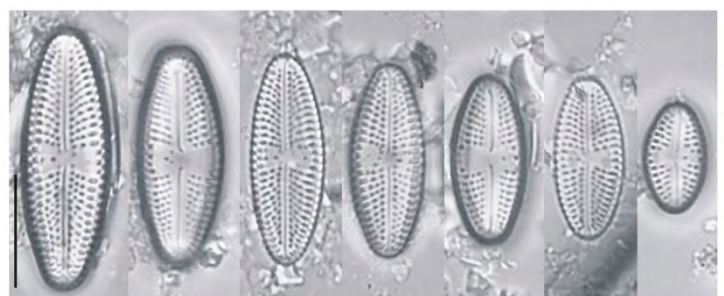
NMW.C.2016.003.Falkland.2015.70.AO



Genus *Luticola*

Luticola* cf. *frequentissima Levkov
(Levkov et al. 2013, pl.4, figs 55–62)

Material examined:



FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.6soil;
NMW.C.2016.003.Falkland.2015.8soil

Luticola robusta Van de Vijver,
Ledeganck & Beyens (Van de
Vijver et al. 2002, p.59, pl.58, figs
1–7)

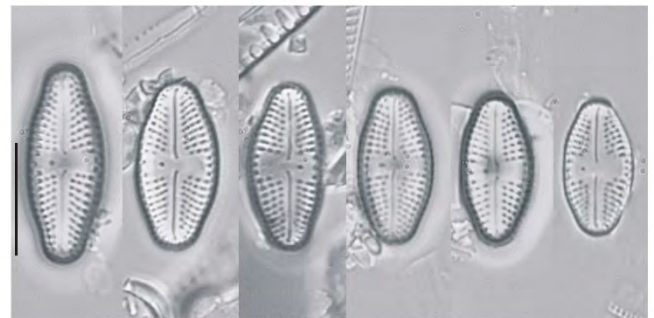
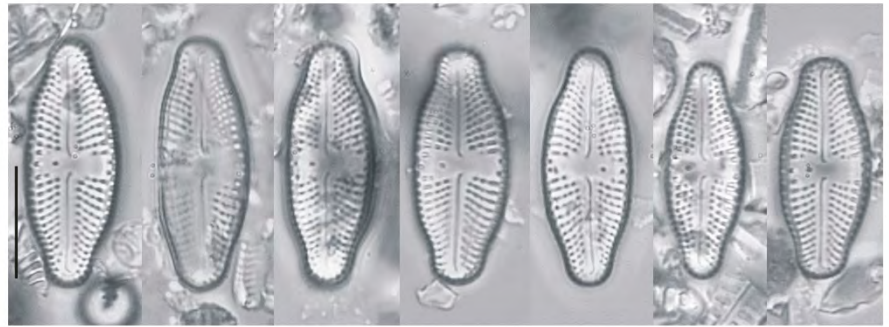
Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.
8soil

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.
33filalg

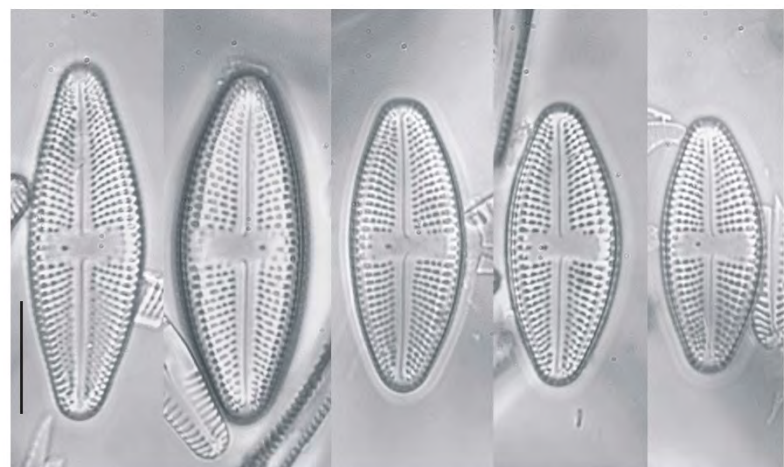
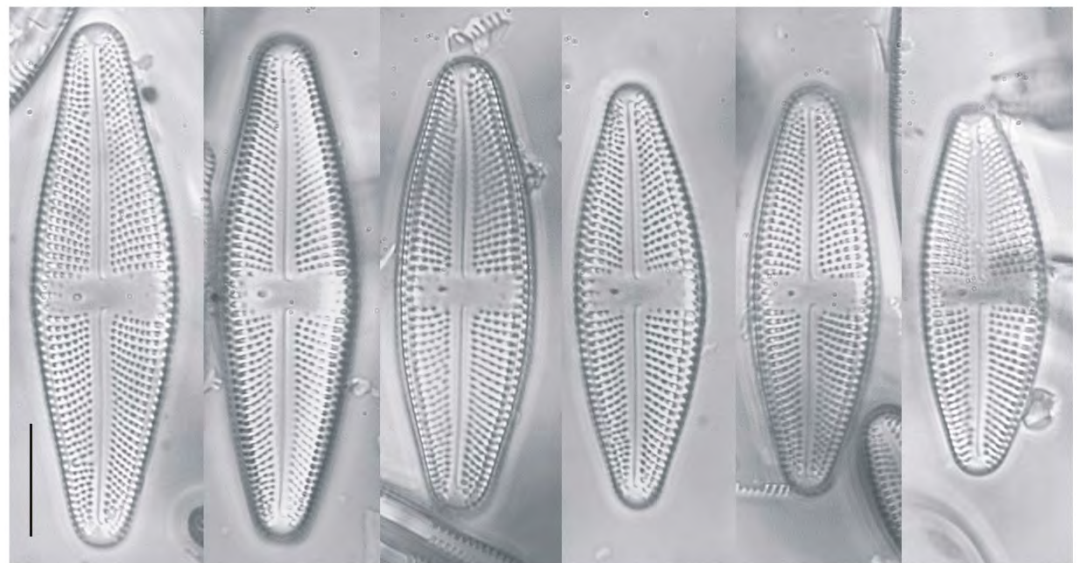


*Luticola
crozetensis* Van de
Vijver, Kopalová,
Zidarova &
Levkov (Levkov et
al. 2013, p.94, 95,
pl.46, figs 1–14)

**Material
examined:**

FALKLAND
ISLANDS:

NMW.C.2016.003.
Falkland.2015.54.
AO



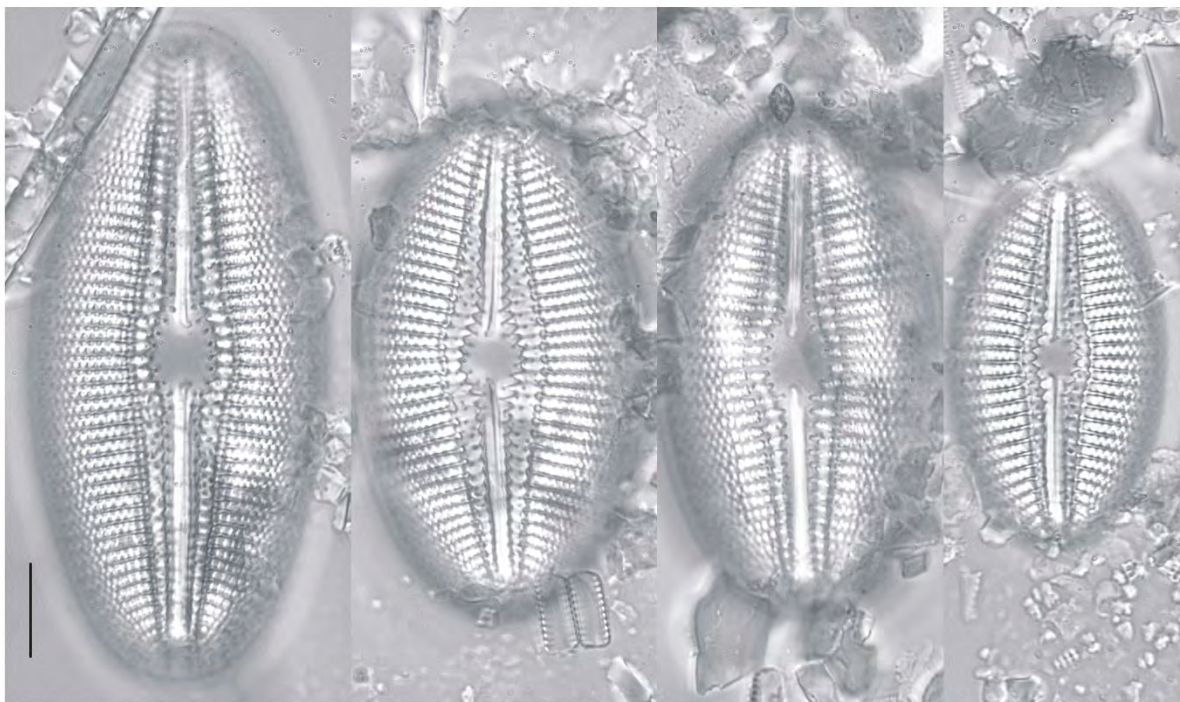
Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Diploneidaceae

Genus *Diploneis*

***Diploneis* sp.1**

Material examined:

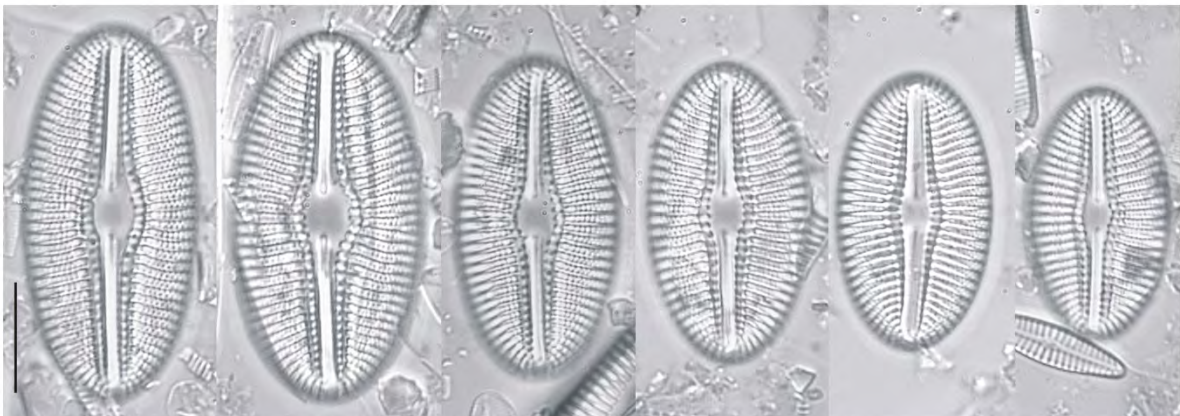
FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.1



***Diploneis* sp.2**

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.22.AO



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Naviculaceae

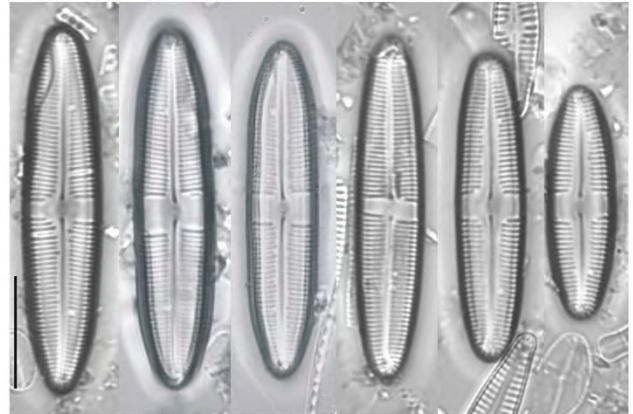
Genus *Caloneis*

***Caloneis* sp.1**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO

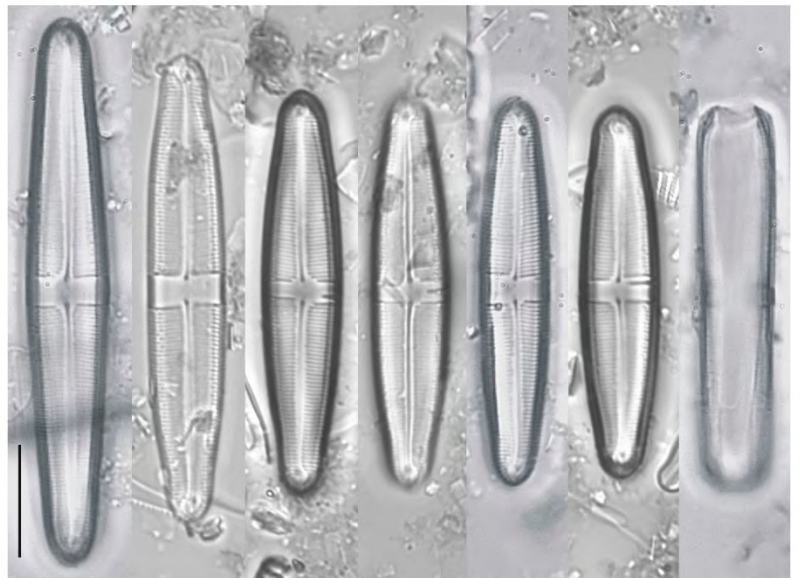


***Caloneis* sp.2**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.
AO



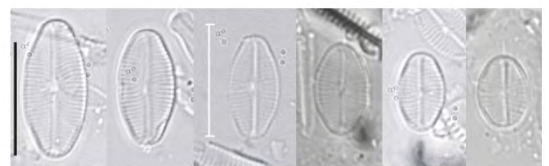
Genus *Lecohuia*

Lecohuia* cf. *corrugata (Manguin) Lange-Bert.
(Rumrich et al. 2000, p.148; Flower 2005, figs 32, 33)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO



Genus *Navicula*

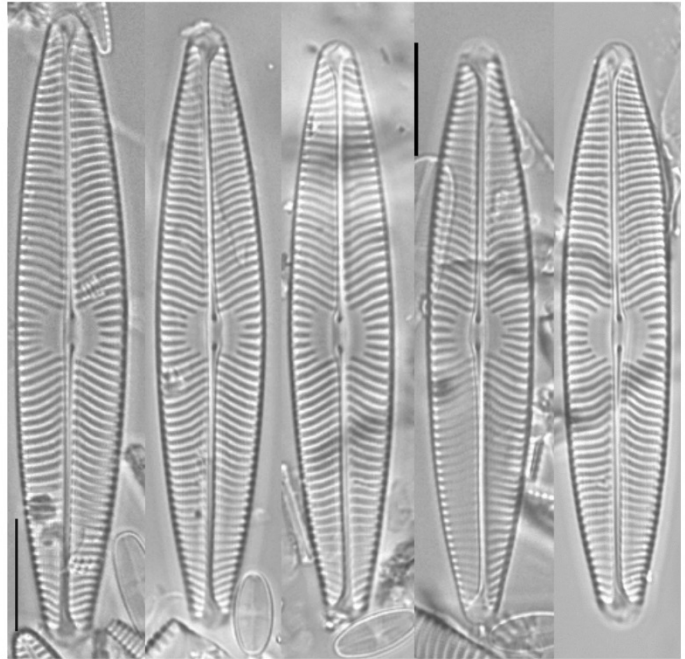
Navicula lanceolata (Agardh) Kütz.
(1844, p.94)

References: Lange-Bert. 2001, pl.39,
figs 15–22)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.4bryo

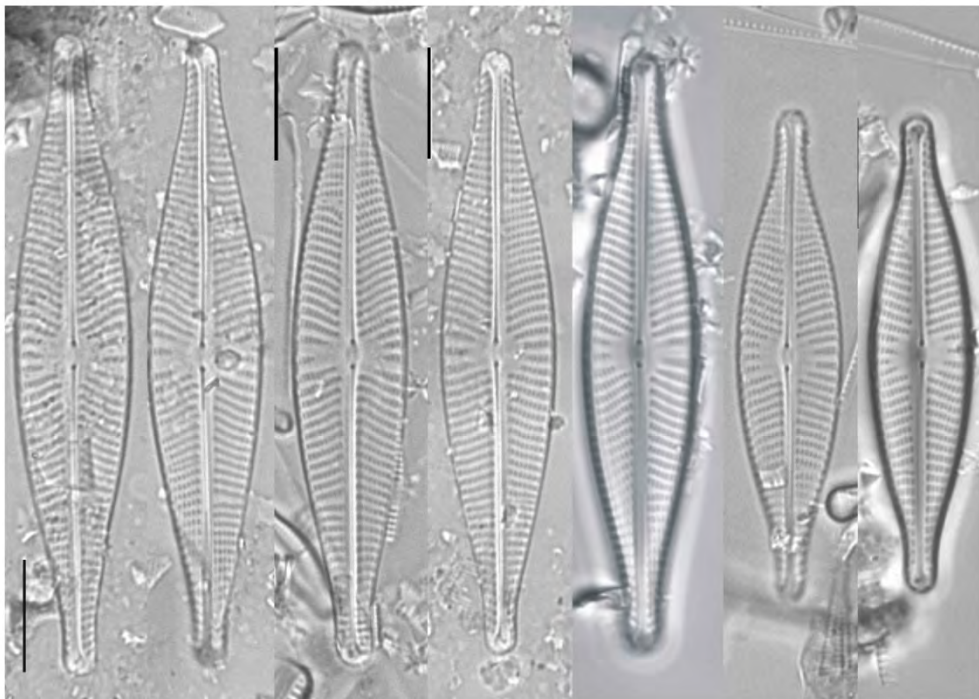


Navicula rhynchocephala Kütz. (1844, p.152)

References: Lange-Bert. 2001 (pl.9, figs 6–10)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.60

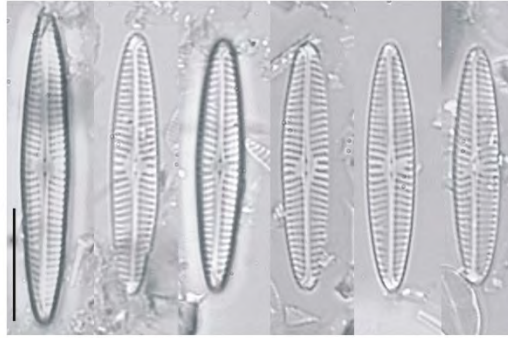


***Navicula* sp.1**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO



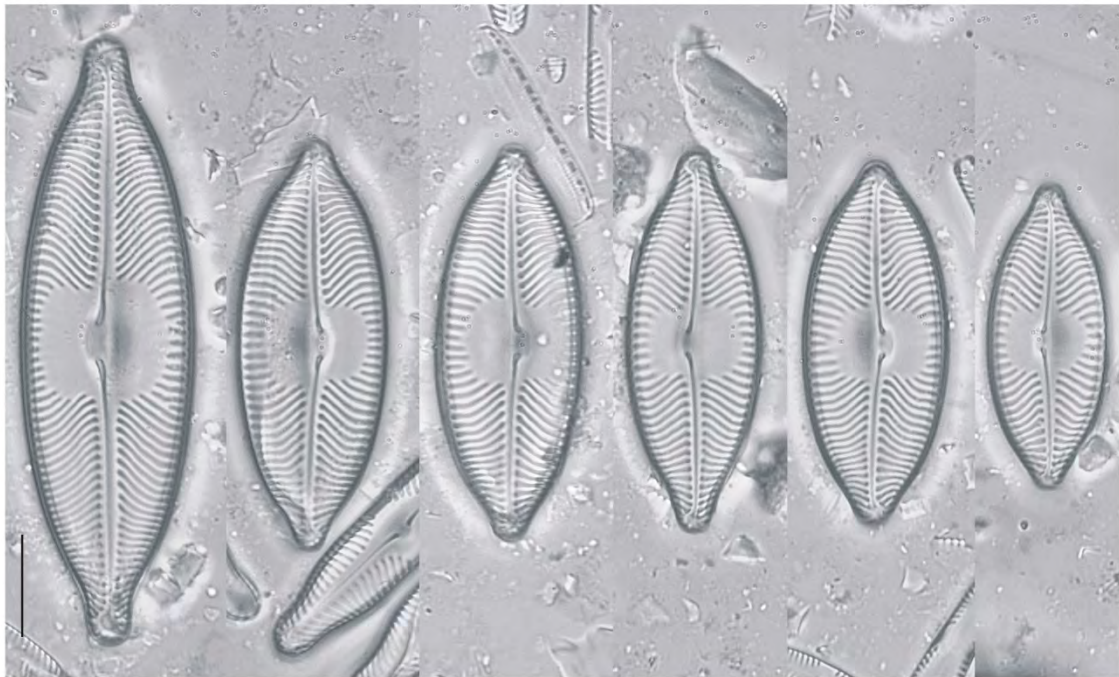
Genus *Pinnunavis*

Pinnunavis elegans (W.Smith) Okuno (Okuno in Tokida & Hiroshi 1975, p.111)

References: Van de Vijver et al. 2002 (p.77, pl.88, figs 1–4, 9)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.3sand



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Stauroneidaceae

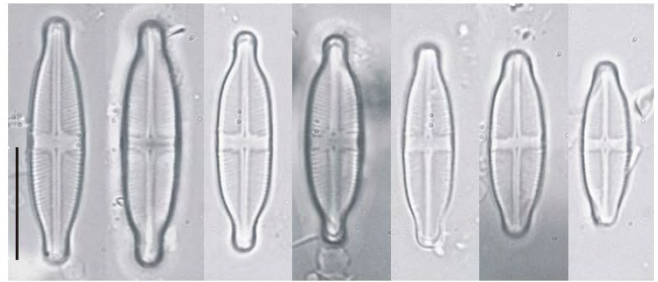
Genus *Stauroneis*

Stauroneis cf. *bertrandii* Van de Vijver & Lange-Bert. (Van de Vijver et al. 2004, p.23, pl.106, figs 1–10)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.11filalg

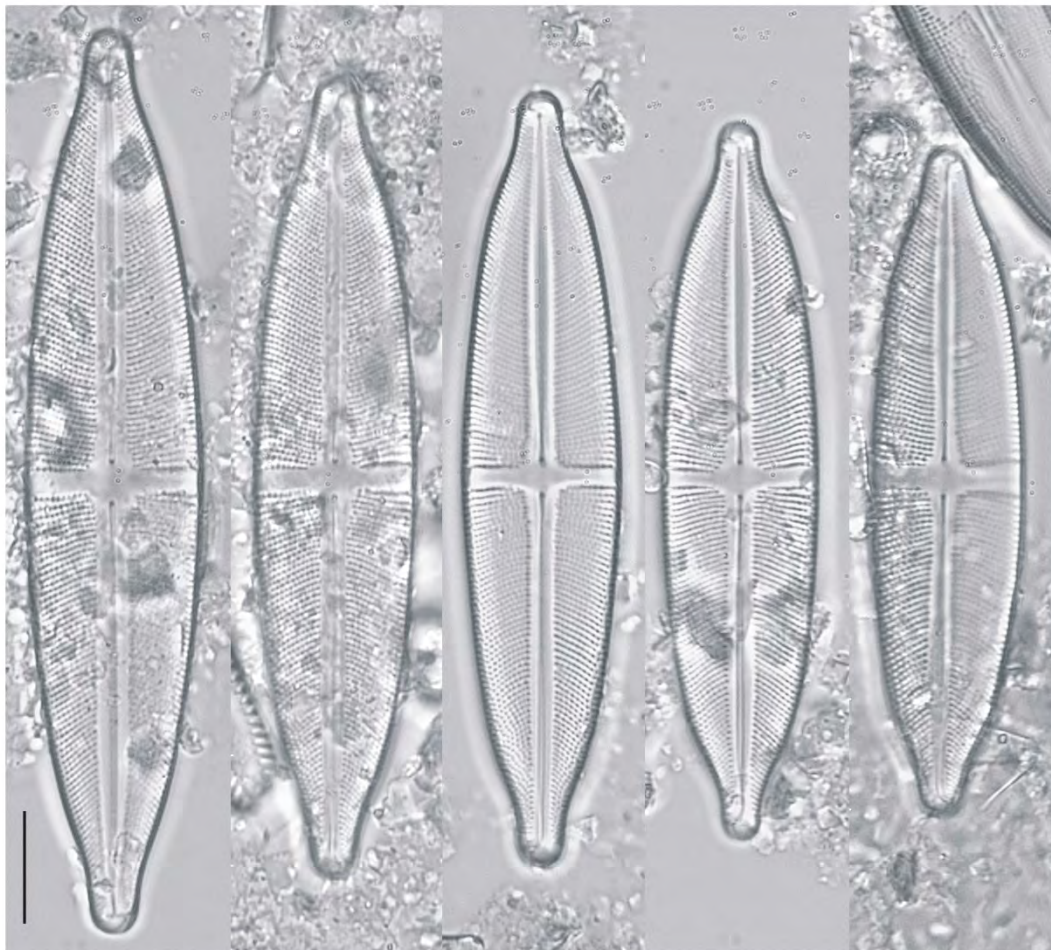


Stauroneis cf. *gracilis* Ehrenberg (1843, p.386 [98], 423, pl.1/2, fig.14, pl.2/1, fig.17)

References: Van de Vijver et al. 2004 (p.38, pl.17, figs 1–4, pl.18, figs 1–4, pl.19, figs 1–4)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.22sed



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Naviculales incertae sedis

Genus *Chamaepinnularia*

Chamaepinnularia cf. *evanida* (Hustedt) Lange-Bert. (Lange-Bert. & Metzeltin 1996, p.34)

References: Hustedt 1942 (p.66, figs 20–21)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.70.AO

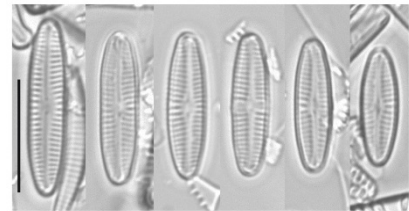


Chamaepinnularia cf. *bremoides* Flower (2005, p.61, figs 74–75)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.35bryo



Genus *Microcostatus*

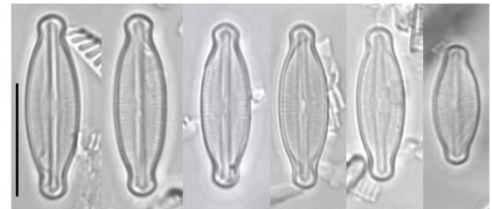
Microcostatus maceria (Schimanski) Lange-Bert. (Lange-Bert. 1999, p.290)

References: Schimanski 1978 (p.586, pl.11, figs 2, 9)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.35bryo



Genus *Veigaludwigia*

Veigaludwigia willeri (Krasske) Lange-Bert. (Rumrich et al. 2000, p.229, pl.74, fig.10)

References: Krasske 1939 (p.389, pl.12, figs 3–4)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO



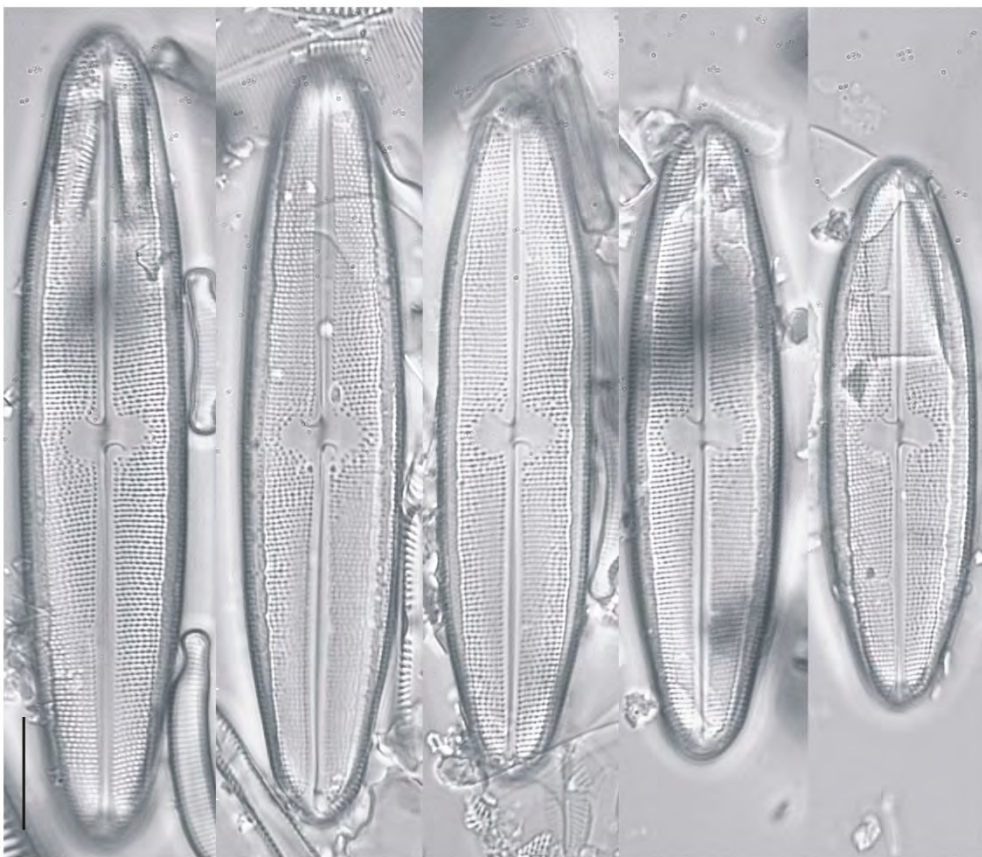
Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Neidiaceae

Genus *Neidium*

***Neidium* sp.1**

Material examined:

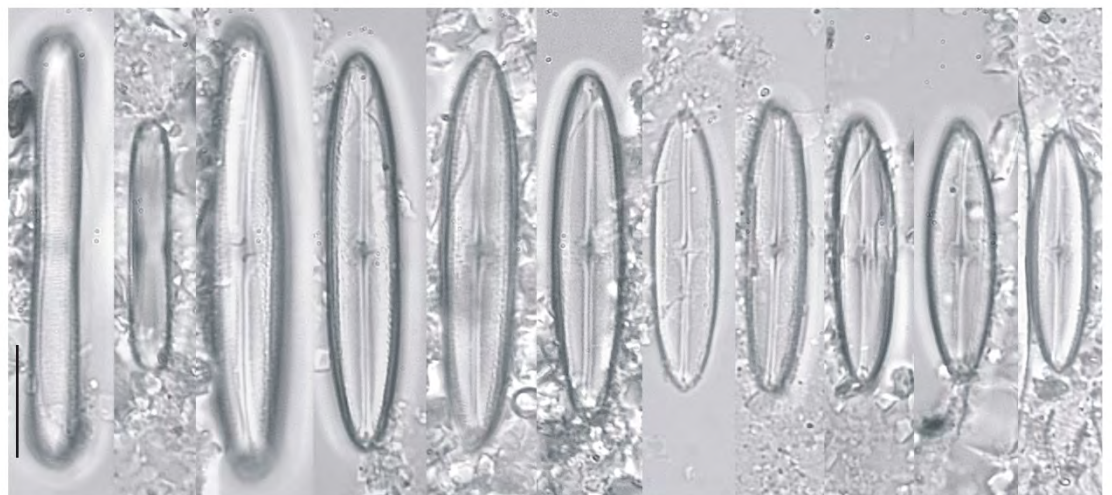
FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.14filalg.mac



***Neidium* sp.2**

**Material
examined:**

FALKLAND
ISLANDS:
NMW.C.2016.
003.Falkland.2
015.22sed



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Amphipleuraceae

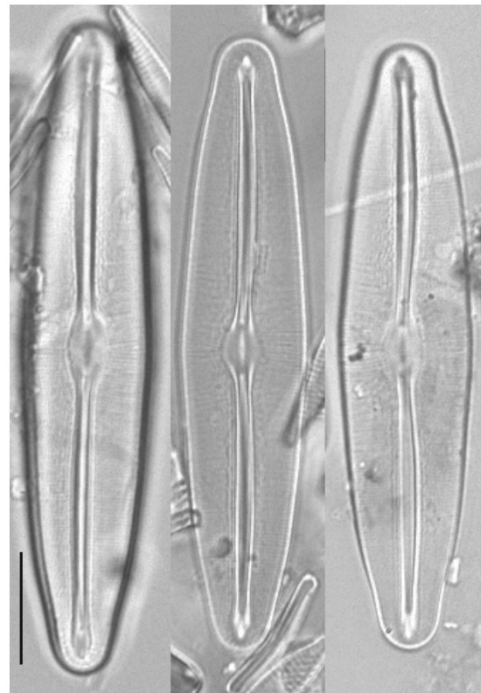
Genus *Frustulia*

Frustulia kosmolliana Lange-Bert. & Rumrich
(Rumrich et al. 2000, p.133, pl.95, figs 1–9)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.11

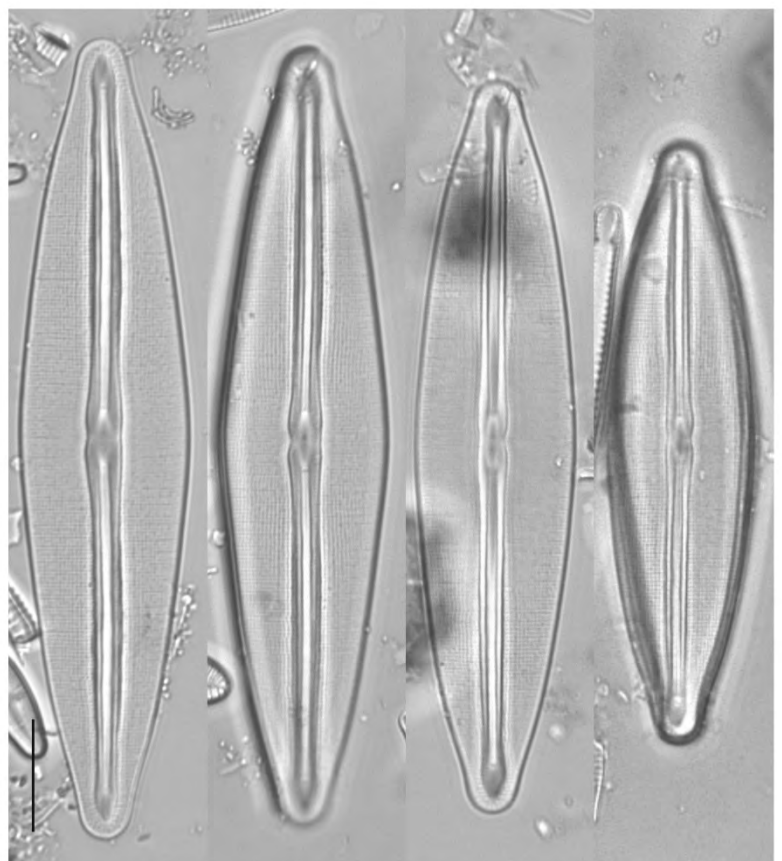


Frustulia pangaeopsis Lange-Bert.
(2001, p.171, pl.130, figs 1–6)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.10



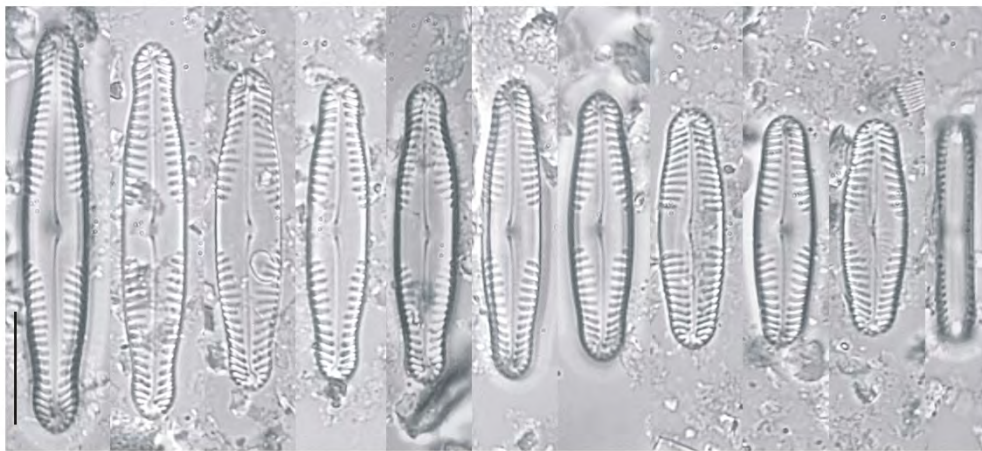
Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Pinnulariaceae

Genus *Pinnularia*

Pinnularia acidicola* var. *acidicola Van de Vijver & Le Cohu (Van de Vijver et al. 2002, p.78, pl. 112, figs 1–10)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.10sed

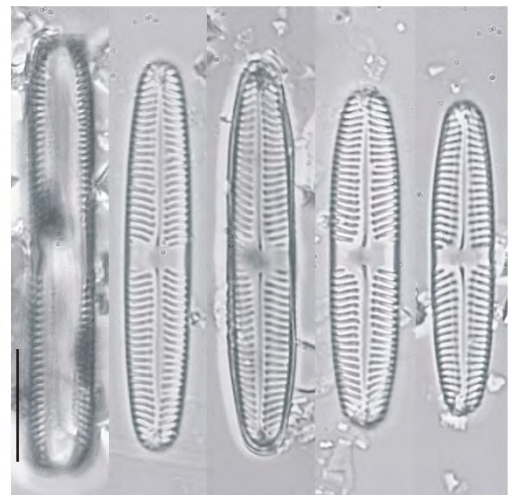


Pinnularia subantarctica* var. *elongata (Manguin) Van de Vijver & Le Cohu (Van de Vijver et al. 2002, p.96, pl.114, figs 1–11)

Material examined:

FALKLAND ISLANDS:

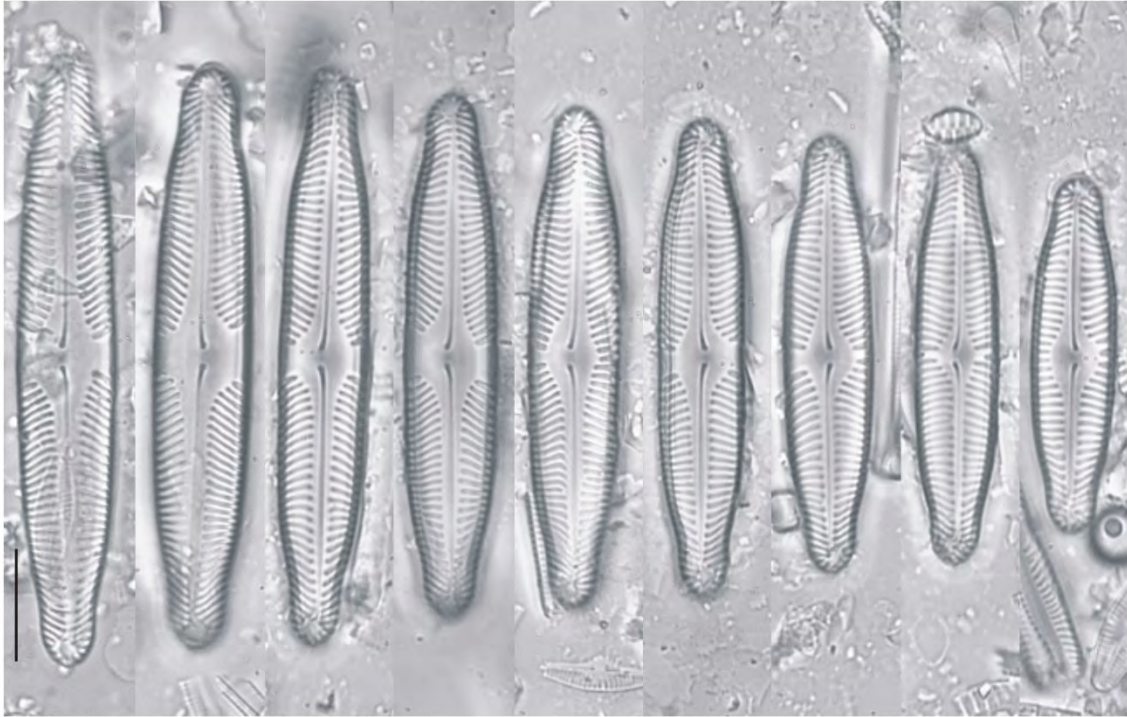
NMW.C.2016.003.Falkland.2015.11filalg



Pinnularia angliciformis Van de Vijver & Beyens (Van de Vijver et al. 2002, p.80, 81, pl. 108, figs 1–13)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.30soil

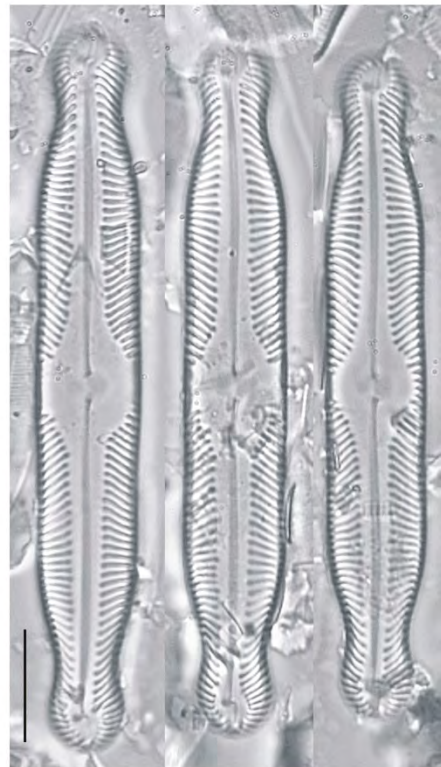


***Pinnularia* sp.16**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.21sed

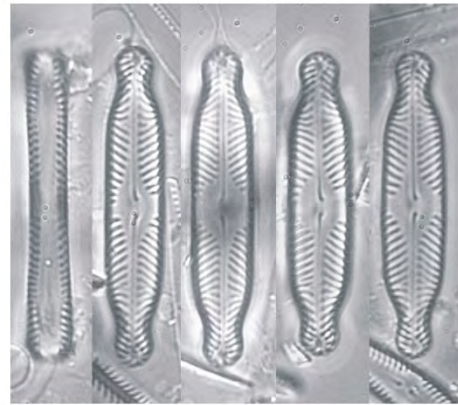


Pinnularia cf. schroeterae Krammer (2000, p.114, pl.88, figs 1–15, 27–29)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.2



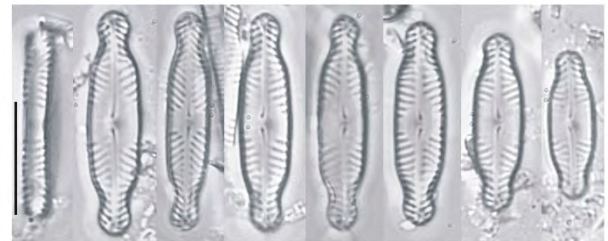
Pinnularia cf. perminor Kulikovskiy, Lange-Bert. & Metzeltin (2010, p.359)

References: Krammer 2000 (p.45, pl.11, figs 18–25)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.11filalg

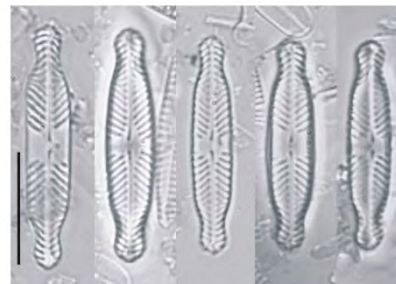


Pinnularia sp.22

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.22.AO

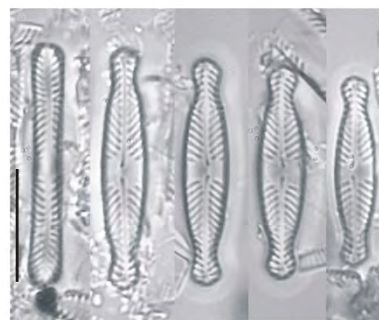


Pinnularia sp.18

Material examined:

FALKLAND ISLANDS:

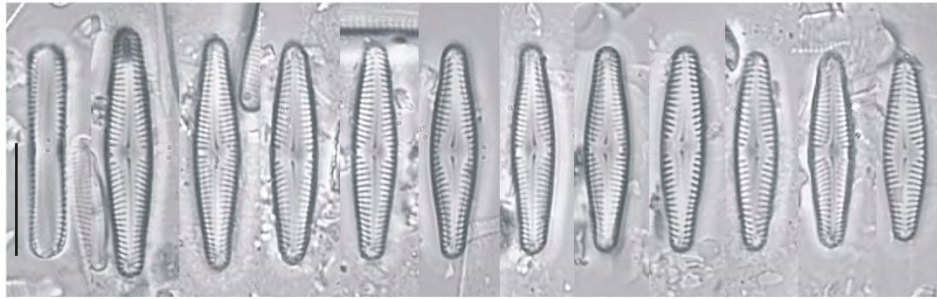
NMW.C.2016.003.Falkland.2015.23.AO



Pinnularia perirrorata Krammer (2000, p.41, pl.17, figs 11–22)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.21soil



Pinnularia sp.19

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.23.AO



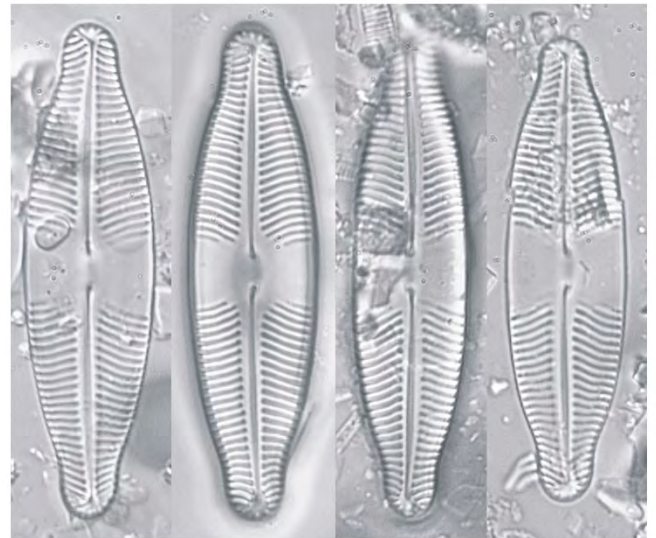
Pinnularia austroshetlandica Carlson (1913, p.16, pl.1, fig.25)

References: Zidarova et al. 2012 (p.28, figs 181–188)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.2

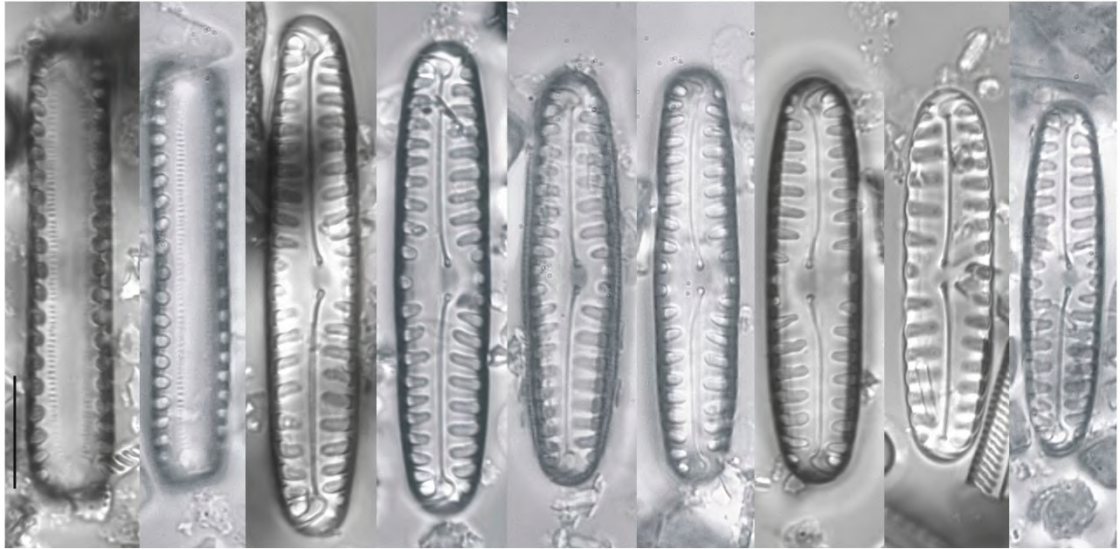


Pinnularia cf. borealis* var. *scalaris

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.8soil

References: Van de Vijver et al. 2002 (p.81, pl.91)

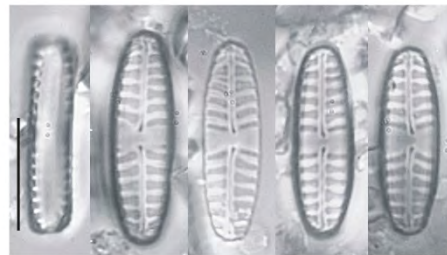


***Pinnularia* sp.6**

Material examined:—

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.8soil

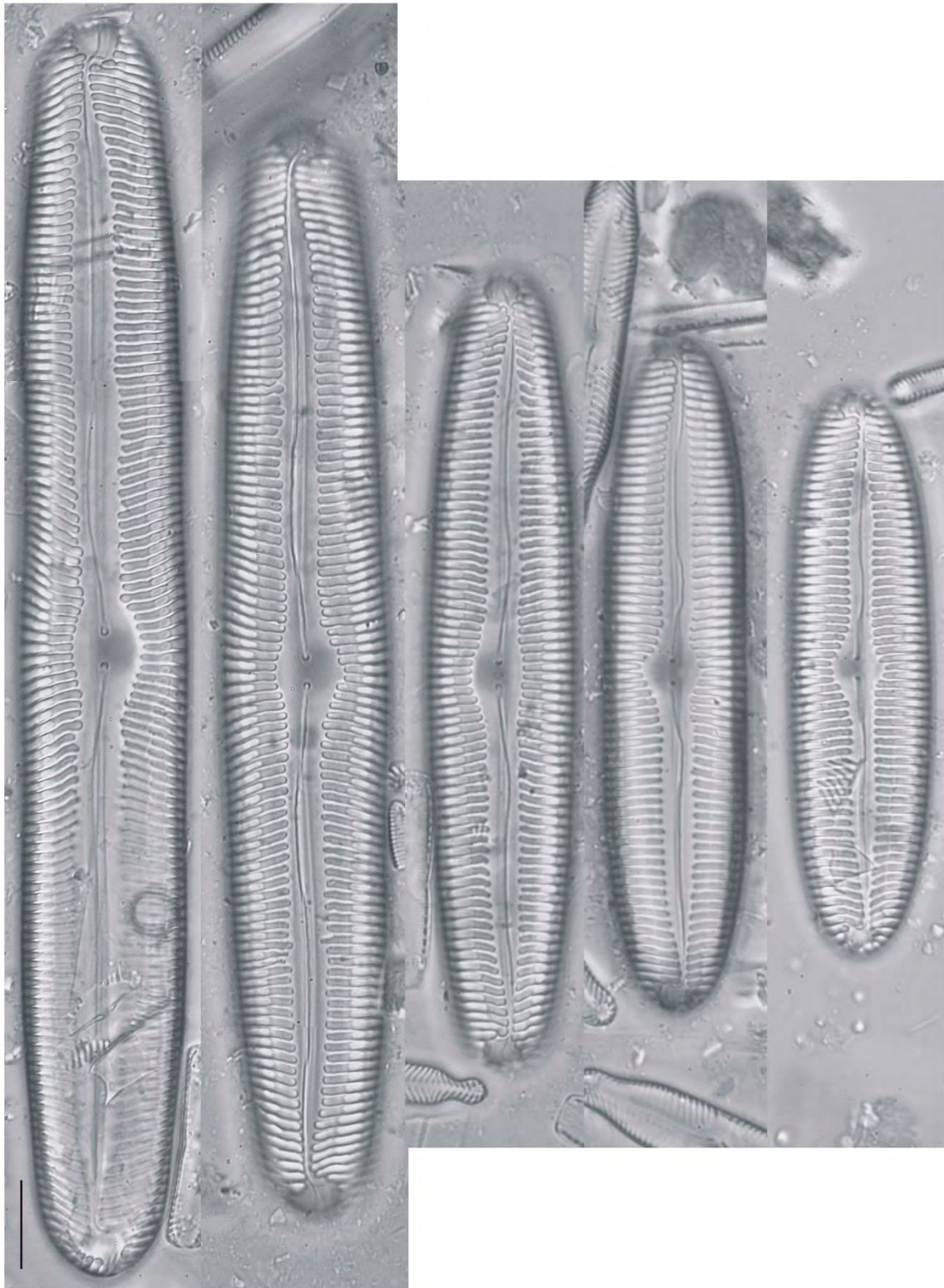


Pinnularia viridiformis Krammer (1992, p.160, 161, pl. 1, fig. 4, pl. 4, fig. 1-4, pl. 68, fig. 1-4, pl. 69, fig. 1-5)

References: Krammer 2000 (e.g. p.167, pl.160, figs 1–6, pl.161, figs 1–4, pl.162, figs 1–4, pl.164, figs 1–4)

Material examined:

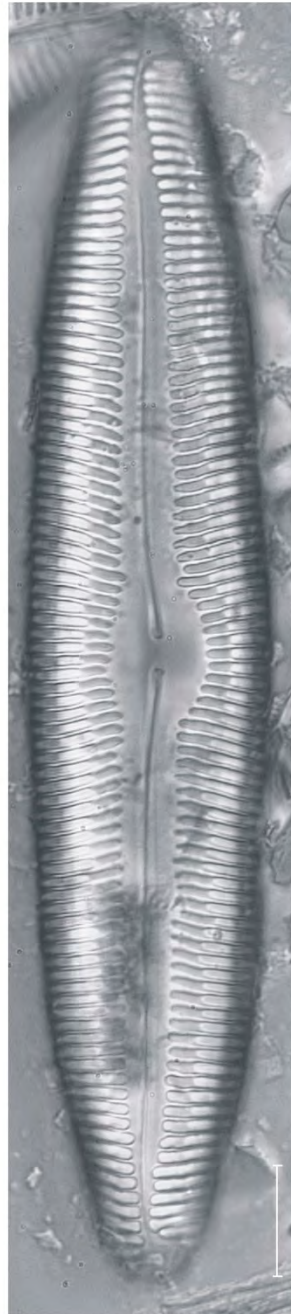
FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.3sand



Pinnularia cf. rhomboelliptica var. *novazealandica* Krammer (2000, p.161, pl.149, p.558)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.13soil

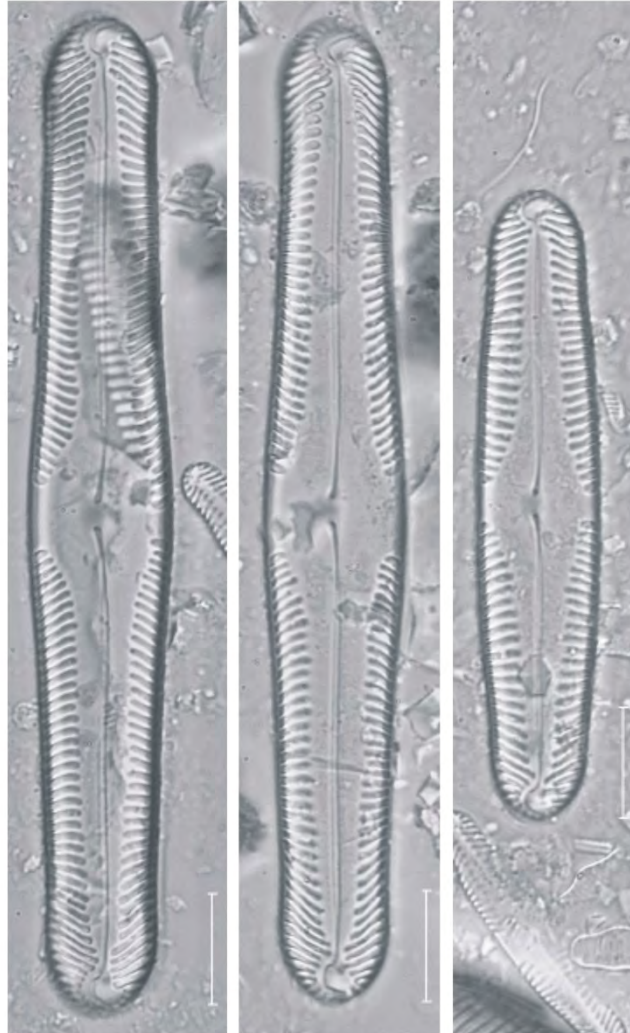


Pinnularia macilenta Ehrenberg (1843, p.421, pl.2/1, fig. 23)

References: Krammer 2000 (p.86, pl.62, figs 1–6, pl.63, figs 1–5, pl.66, figs 1, 2)

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.13soil

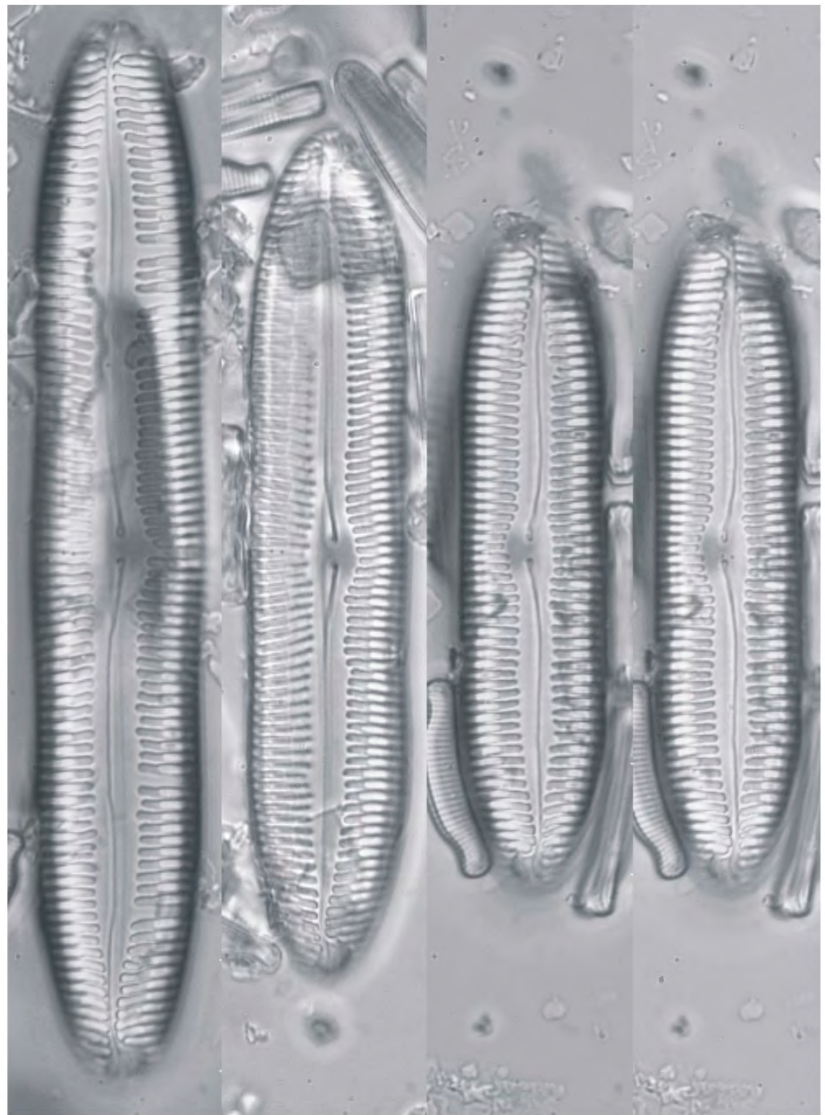


Pinnularia cf. reichardtii

Krammer (2000, p.151,
pl.130, figs 4–7)

Material examined:

FALKLAND ISLANDS:
NMW.C.2016.003.Falkland.
2015.14filalg.mac



Pinnularia sp.20

Material examined:

FALKLAND ISLANDS:
NMW.C.2016.003.Falkland.2015.30soil

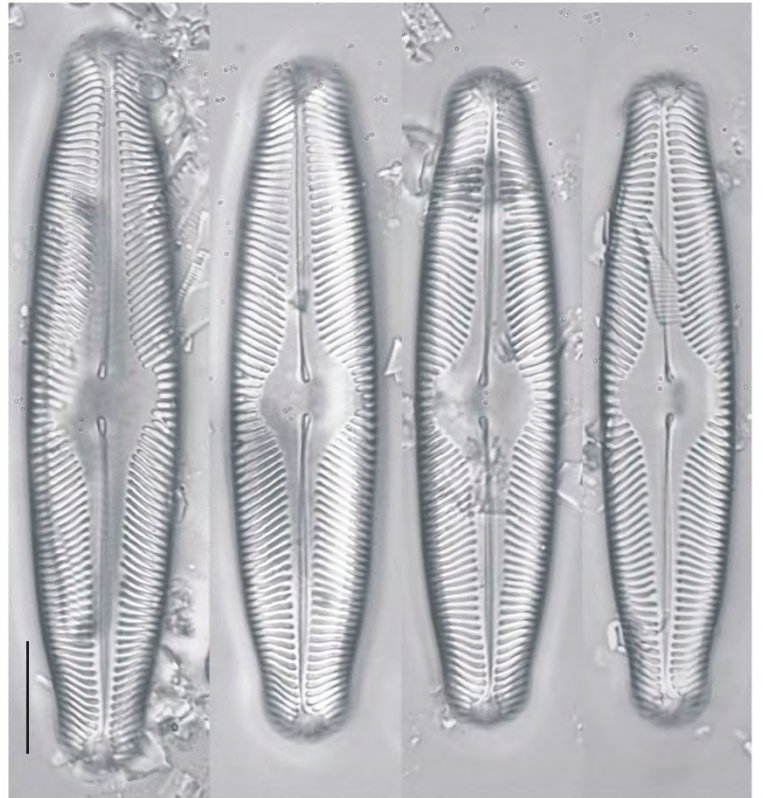


Pinnularia decrescens* var. *keruelensis
Van de Vijver & Le Cohu (Van de Vijver
et al. 2002, p.84, pl.101, figs 1–5)

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.33soil



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Naviculales
Family Sellaphoraceae

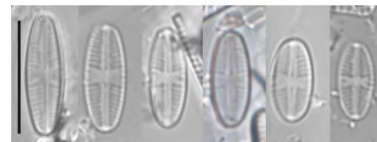
Genus *Sellaphora*

Sellophora* cf. *nigri (De Not.) Wetzel & Ector
(Wetzel et al. 2015, p.221, figs 319–393)

Material examined:

FALKLAND ISLANDS:

NMW.C.2011.040.Falkland.2011.4bryo



Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Rhopalodiales
Family Rhopalodiaceae

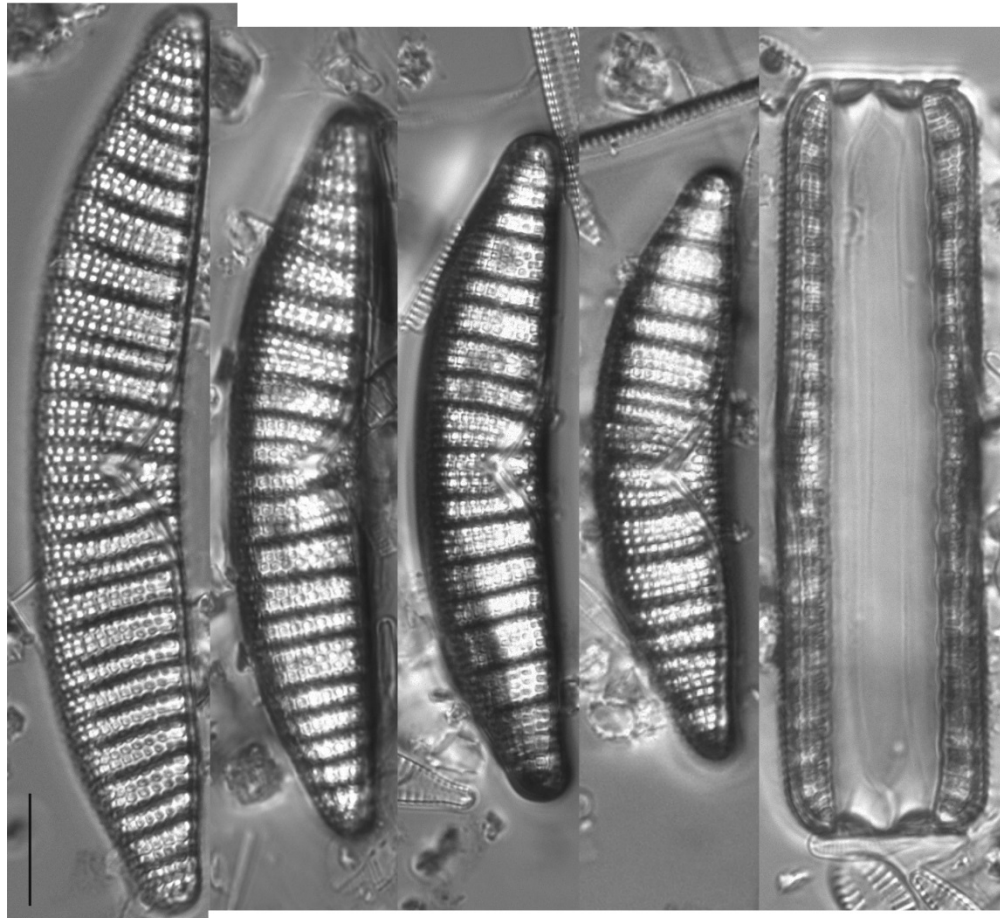
Genus *Epithemia*

Epithemia adnata (Kütz.)
Brébisson (1838, p.16)

References: Krammer &
Lange-Bert. 1988 (pl.107,
figs 1–6)

Material examined:

FALKLAND ISLANDS:
NMW.C.2016.003.Falkland
.2015.119bryo



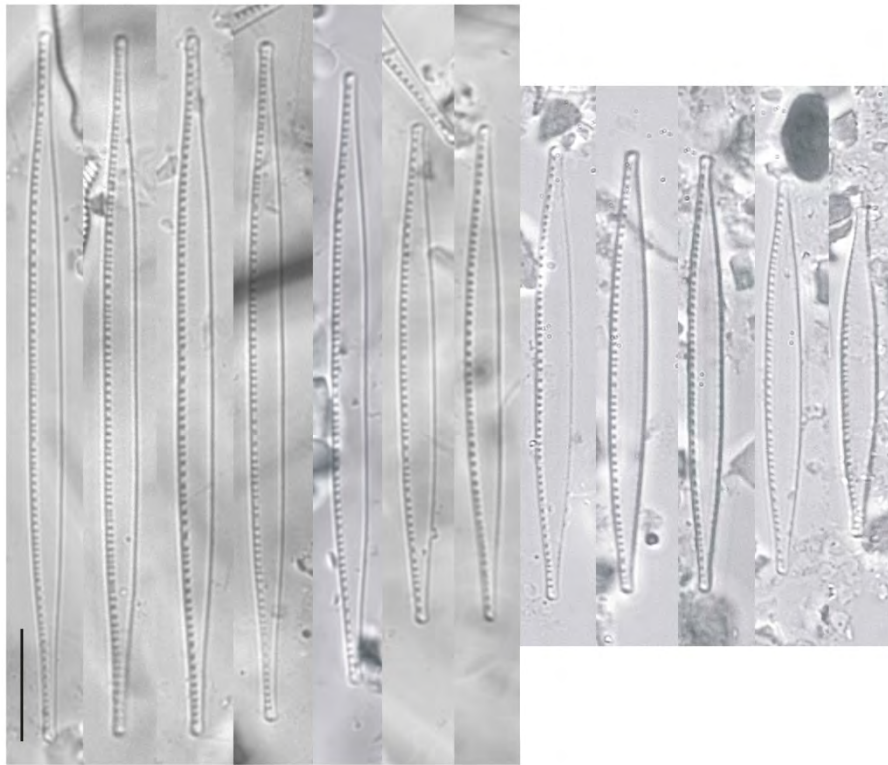
Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Bacillariales
Family Bacillariaceae

Genus *Nitzschia*

Nitzschia gracilis Hantzsch (1860, p.40, pl.6, fig.8)

Material examined:

FALKLAND ISLANDS: NMW.C.2011.040.Falkland.2011.2
FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.22sed

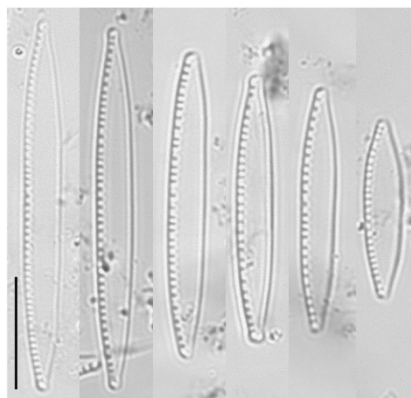


***Nitzschia* sp.5**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.87



***Nitzschia* sp.3**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.60

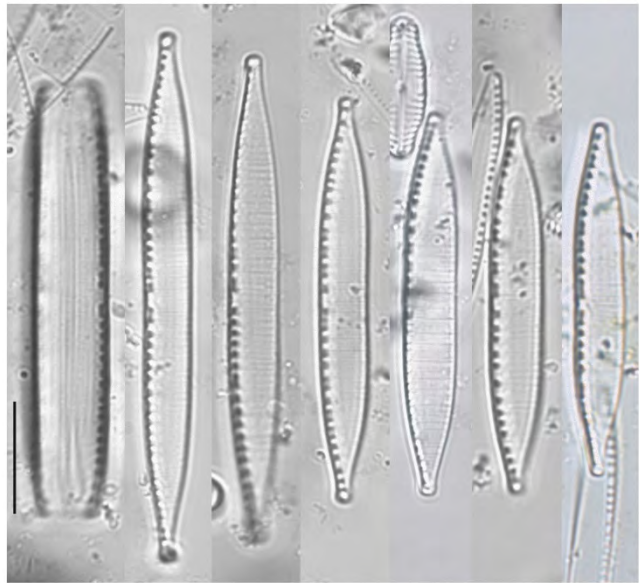


***Nitzschia* sp.4**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.87

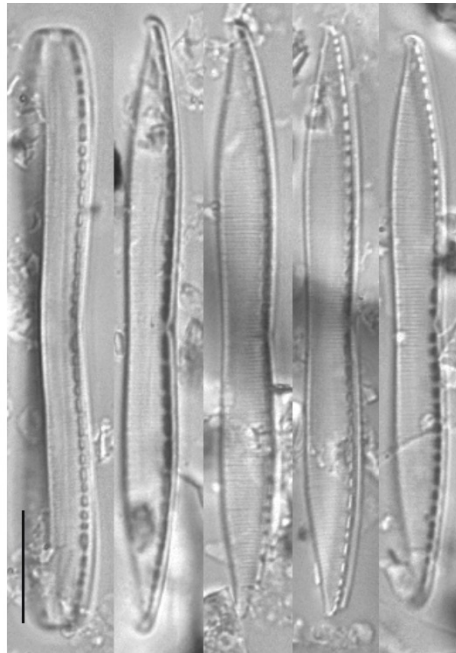


***Nitzschia* sp.7**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.6soil

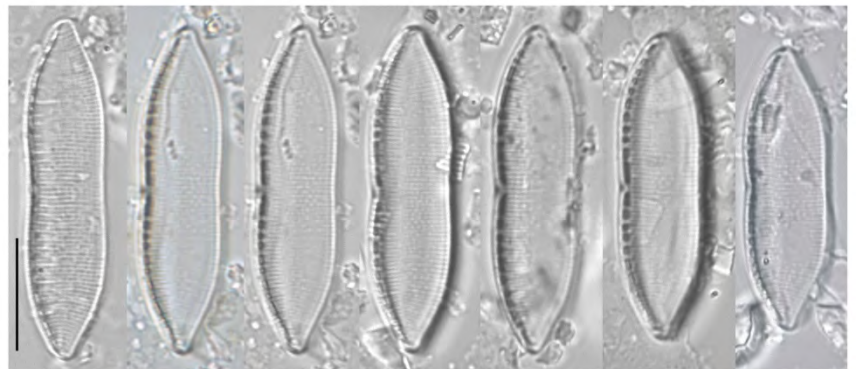


***Nitzschia* sp.8**

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.
24soil

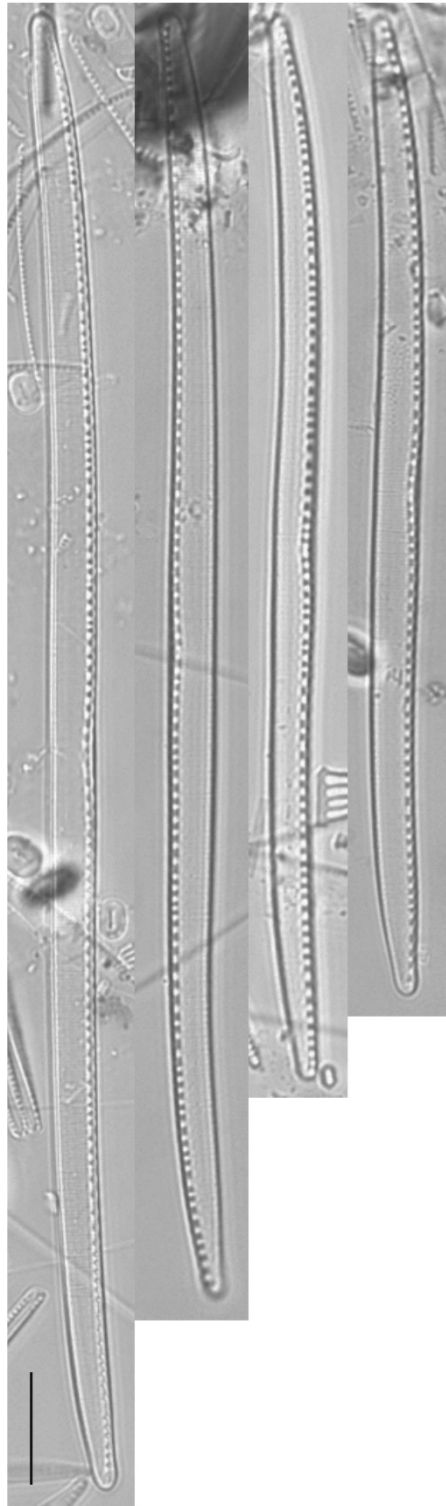


Nitzschia sp.6

Material examined:

FALKLAND ISLANDS:

NMW.C.2016.003.Falkland.2015.91



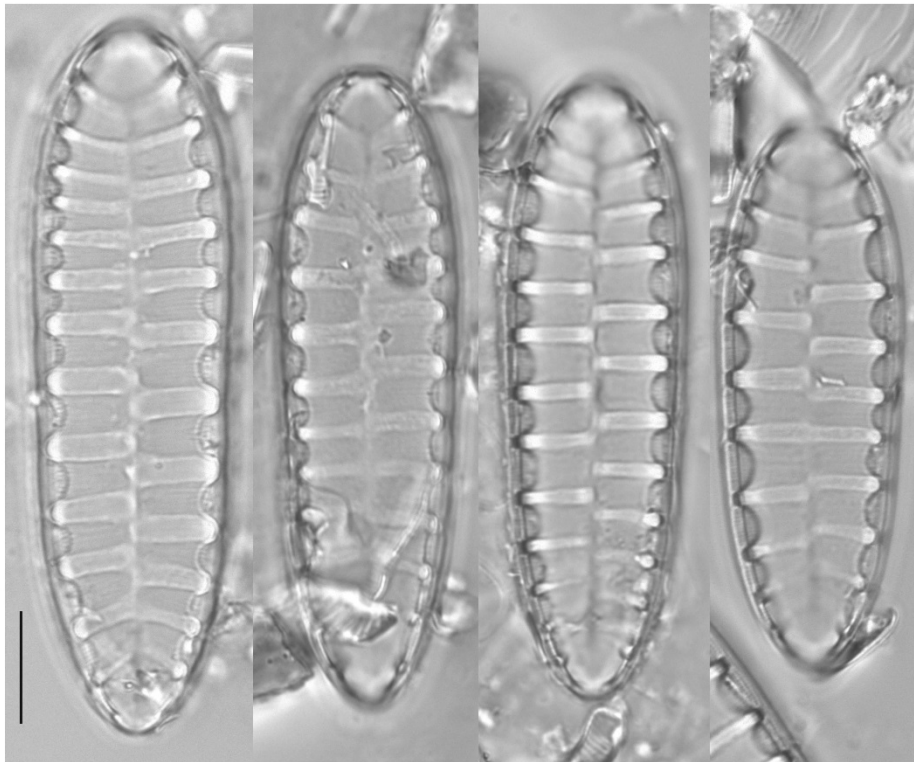
Division Bacillariophyta
Subdivision Bacillariophytina
Class Bacillariophyceae
Subclass Bacillariophycidae
Order Surirellales
Family Surirellaceae

Genus *Surirella*

***Surirella* sp.1**

Material examined:

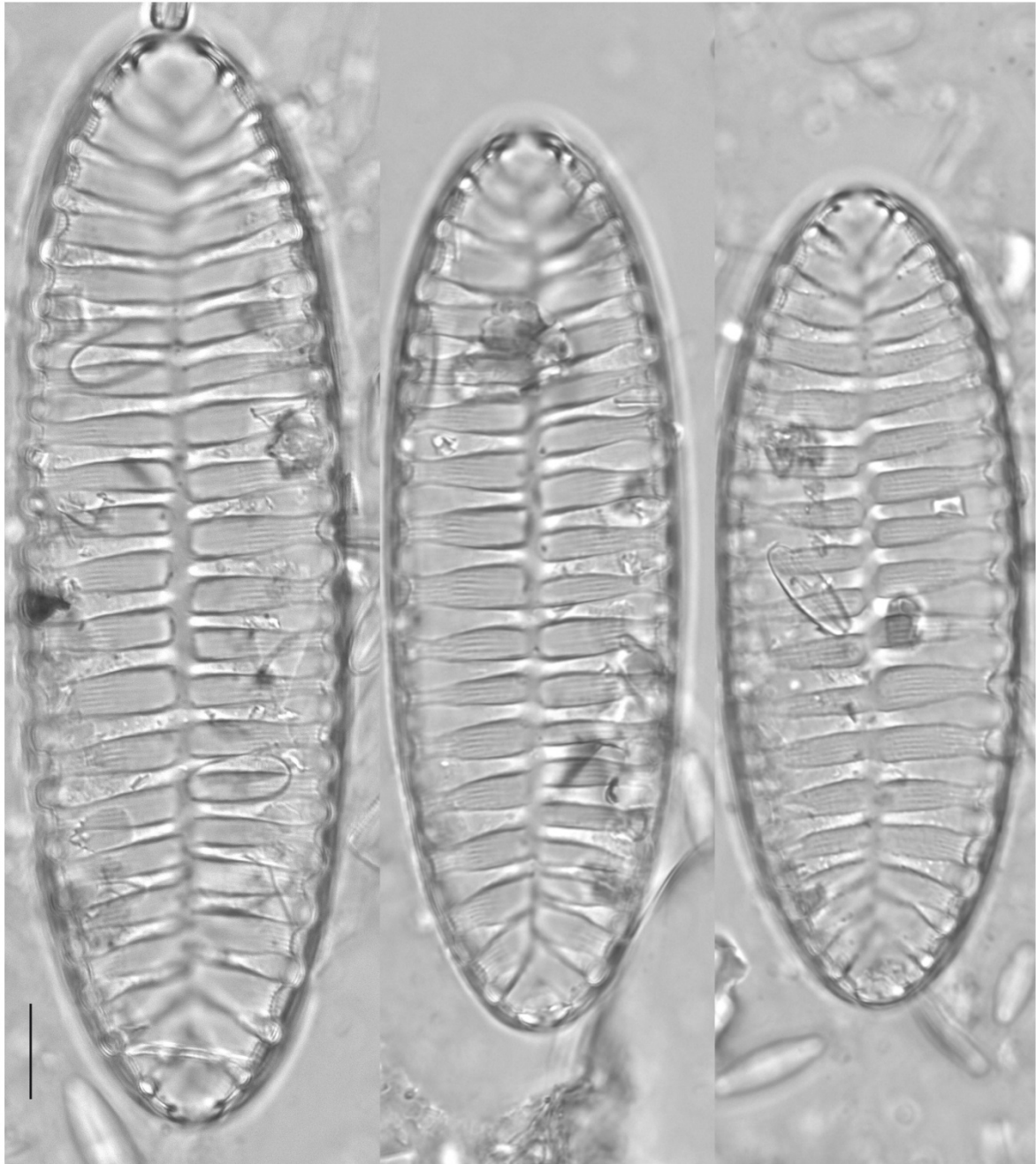
FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.21sed



Surirella sp.2

Material examined:

FALKLAND ISLANDS: NMW.C.2016.003.Falkland.2015.45bryo



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