The Scandinavian Culture Centre for Algae and Protozoa

by

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With 5 figures


Abstract: The Scandinavian Culture Centre for Algae and Protozoa (SCCAP) at the University of Copenhagen is based on the collection of algal cultures started in the 1950s and 1960s by the late Tyge Christensen (1918–1996). This collection grew steadily in the 1970s and 1980s and the SCCAP was officially opened in 1987. The Centre now comprises c. 600 strains (200 species). The SCCAP contains major collections of marine planktonic flagellates, benthic marine brown and green algae and a more limited number of freshwater algae, particularly xanthophytes.

A brief historical account of SCCAP

The concept of a Scandinavian Culture Centre for Algae and Protozoa (SCCAP) at the University of Copenhagen was first developed in 1986 in the recommendations by the international panel evaluating ‘Danish Hydrobiology’. The idea was accepted by the Institut for Sporeplanter (now Department of Phycology) and supported by the Science Faculty at the University of Copenhagen and the Danish National Science Foundation. The SCCAP is based on the collection of algal cultures set in the 1950s and 1960s by the late Tyge Christensen (1918–1996) at the University of Copenhagen. This collection grew steadily in the 1970s and 1980s and the SCCAP now comprises c. 600 strains (200 species; Fig. 1). The SCCAP contains major collections of marine planktonic flagellates (Figs 2, 3), benthic marine brown (Fig. 4) and green algae and a more limited number of freshwater algae, including a number of xanthophytes, particularly Vaucheria ss. Only few red algae are maintained.

Now, details of the SCCAP, e.g. a list of strains, media recipes references etc., are available on the web site of the SCCAP: http://www.sccap.bot.ku.dk/

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Maintenance and culturing media

The majority of the cultures are maintained at 15°C and an 16:8 L:D cycle (Fig. 5), but some are maintained at 4°C (e.g. *Pyramimonas cyrtoptera* and other arctic strains), 20°C (e.g. *Gymnodinium nollerii* Ellegaard et Moestrup) or 25°C (tropical strains, mainly from the IOC Science and Communication Centre on Harmful Algae).

The culture media used are:

**MV** (Christensen 1982)

We have used MV (Marine medium with Vitamins) for many years as a standard medium for marine benthic algae. This is the medium named ESI by Tatewaki (1966) but supplemented with vitamins.

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**Fig. 2. Akashiwo sanguinea** (Hirasaka) Gert Hansen et Moestrup (Dinophyta) from marine plankton, Isefjord, Denmark. Strain no. K-0405. **Fig. 3. Pyramimonas cyrtoptera** Daugbjerg (Prasinophyceae) from ice, Igloolik, Canada. Strain no. K-0382. **Fig. 4. Eudesme virescens** (Harv.) J. Agardh (Phaeophyceae) from Disko Bay, Greenland.
Fig. 5. The 15°C culture room of the SCCAP with the curator, Niels Henry Larsen. Photo by Leif Bolding

**T, TL** (Larsen et al. 1994) & **TLS** (N.H.Larsen unpublished.)

These media are modifications of an Erd-Schreiber medium. Modifications include addition of the „L1“ trace-metal formula (Guillard & Hargraves 1993) and omission of autoclaving. This medium is used for marine flagellates and macroalgae.

**L** (Guillard & Hargraves 1993)

This has been developed from the famous “f/2” medium (and “K” by Keller et al. 1987). We use it as standard medium for marine diatoms.

**SC** (Christensen 1982) & **SC10**

These two media differ only in the type of water used. The SC medium contains glass-distilled water (or similar quality), the SC10 is based on seawater with a salinity adjusted to 10 psu. These media are used primarily for *Vaucheria* species.

**NF2 & NF2A**

This freshwater medium is a slight modification (the method for preparation and amount of soil extract is slightly different) of the Bs medium (Christensen 1982). It is used for all groups of freshwater algae.
MWC

A freshwater medium, made as described by Christensen (1982). It is used for all groups of freshwater algae.

Details of the media are found on the web-site of the culture collection: http://www.sccap.bot.ku.dk/

Uses of the SCCAP

In addition, the culture facilities at the Department of Phycology contain a number of cultures, which are mainly supervised and maintained by the scientific staff, e.g. the BIOBASE culture collection containing marine, benthic algae collected along the salinity gradient in Danish waters and into the Baltic proper.

The uses of the SCCAP and additional cultures include:
- Providing material for student projects, Master- and Ph.D.-theses
- Providing material for teaching purposes, e.g. courses on toxic marine phytoplankton held by the IOC Science and Communication Centre on Harmful Algae and graduate courses on identifying marine phytoplankton
- Providing material for autecological studies, as the culture collection has facilities for growing algae under a variety of temperature- and light controlled conditions
- Providing material for systematic, phylogenetic and biogeographic studies
- Providing material for toxicity analyses by e.g. HPLC
- Providing material for analyses of environmental impact on ecosystems
- Providing material from the arctic/subarctic environment in Greenland (e.g. Eudesme virescens, Fig. 4)

Some of the most common species are represented by several strains, for example Ulva intestinalis (L.) Ness, Scytosiphon lomentaria (Lyngbye) Link, and Pylaeiella littoralis (L.) Kjellman. These are used for e.g. the study of inter-populational differences.

Future projects

One of the most pressing goals of the Centre is to introduce cryopreservation for a number of cultures. We hope to draw on the experience of other culture collections. Once the number of cultures requiring regular sub-culturing has been reduced, the SCCAP hopes to expand its activities by including further strains, including additional toxic species and strains from tropical areas. These will be made generally available for research and teaching.

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References


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