SMHI

AlgAware

Oceanographic Unit
No 8, 27 July-1 Aug 2009

ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Abstract

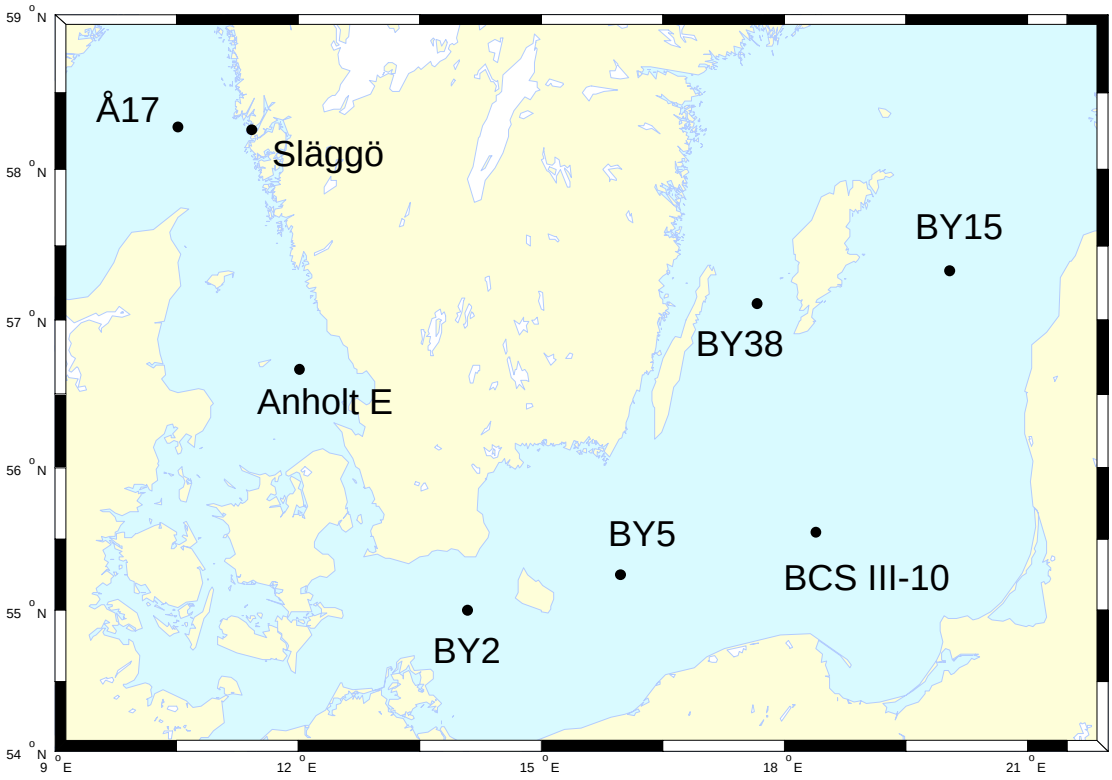
The phytoplankton diversity was overall low in the Skagerrak area. The diversity was although higher at the more inshore station Släggö where several species were found. Dominating species at this site were both the diatom *Pseudo-nitzschia* and the dinoflagellate *Prorocentrum micans. The* water column *was well mixed and only Å17 had a* chlorophyll fluorescence maximum at 30-40 meters with a dominance of the dinoflagellate *Ceratium longipes.*

The diversity was higher in the Kattegat except for Fladen. The diatom *Proboscia alata* dominated the integrated samples at all stations. *A* chlorophyll fluorescence maximum was recorded at Anholt E at 30-40 meters and at Landskrona at 15 meters. The dominating species at the maximum was the dinoflagellate *Ceratium longipes* at Anholt E and the diatom *Guinardia flaccida* at Landsrona.

In the Baltic, small surface accumulations of cyanobacteria were observed east of BY5 and observed on and of until BCS III-10. No accumulations were observed north of BCS III-10 but both *N. spumigena*, *Aphanizomenon* spp. and *Anabaena* spp. were detected in both surface samples and in integrated samples. The winds stress probably disolved the patchess. The amount of *N. spumigena** and *Aphanizomenon* spp decreased going Southwest of Gotland and only small amounts were found in the Kalmar sound. *Anabaena* spp. seemed however to increase slightly in the southern part of Kalmar sound.

To follow the surface accumulations of cyanobacteria in the Baltic Sea by satellite interpretations and high resolution images:
http://www.smhi.se/cmp/jsp/polopoly.jsp?d=7826&l=en

The phytoplankton samples were filtered through 10 µm polycarbonate filters before being analysed using a light microscope. Potentially toxic species are marked with *. To observe which of the cyanobacteria species were dominating the surface accumulations, bucket sampling was performed at most of the Baltic stations. Small species, e.g. *Chrysochromulina polylepis** can not be analysed onboard and will be exluded from this reduced AlgAware report



The Skagerrak

Å17 27th of July (open Skagerrak)
The phytoplankton diversity was low, the dinoflagellate genus *Ceratium* was observed. A chlorophyll fluorescence maximum at 30-40 meters depth was dominated by *Ceratium longipes.*

Släggö 27th of July (Skagerrak coast)
A quite diverse community was found. The dinoflagellate *Prorocentrum micans* dominated together with the diatom genus *Pseudo-nitzschia.* The dinoflagellate *Dinophysis acuminata** was also observed

P2 29th of June (Skagerrak coast)
The diatom Proboscia alata dominated the community. Several species of the dinoflagellate genus *Ceratium* was found together with a few individuals of *D. acuminata* * and *D. norvegica* *

The Kattegat

Fladen 30th of June
Few species were found. The diatom *Proboscia alata* dominated the sample. Several species of the dinoflagellate genus *Ceratium* was also found.

N14 Falkenberg 30th of June
The diatom, *Proboscia alata,* dominated hear as well but in a slightly more diverse community. A few filaments of the cyanobacteria *Nodularia spumigena** were found. *The dinoflagellate Dinophysis norvegica** was also found.

Anholt E 30th of June
The diatom *Proboscia alata* dominated the sample once again. The dinoflagellate *Ceratium tripos* was also quite common. A chlorophyll fluorescence maximum was located at 25-30 meters where the dinoflagellate genus *Ceratium* dominated and far most *Ceratium longipes*. The dinoflagellates *Dinophysis acuminata** and *D. norvegica** was also present. The community was more or less the same on the second stop at the station but no chlorophyll fluorescence maximum was present this time.

W Landskrona 30th of June
A divers community was found. The diatom *Proboscia alata* although continued to dominate. Several species of dinoflagellates were found for example *Dinophysis acuminata* *, *D. norvegica* * and *Protoceratium reticulatum* *. Several species of the genus *Chaetoceros together with the genus Pseudo-nitzschia* spp.* was noted among the several diatoms found. Both the filamentous cyanobacterium *Nodularia spumigena** and the genus *Anabaena* spp. were found in low abundances.

Selection of observed species	**Å17**	**Släggö**	**N14**	**Anholt E**	**Anholt E**
Red=potentially toxic species	**2009-07-27**	**2009-07-27**	**2009-07-28**	**2009-07-28**	**2009-08-01**
[1] quantified in m/l	**cells/l**	**cells/l**	**cells/l**	**cells/l**	**cells/l**
Chaetoceros curvicetus		present			
Chaetoceros socialis		present			
Chaetoceros spp.		present			
Guinardia flaccida		present			
Proboscia alata		present	common	common	common
Pseudo-nitzschia spp.		common			
Thalassiosira spp.			present		present
Ceratium furca		present		present	
Ceratium fusus		present	present	present	present
Ceratium lineatum			present	present	
Ceratium longipes	present				
Ceratium macroceros		present			
Ceratium tripos		present	present	common	present
Dinophysis acuminata		present		present	
Dinophysis norvegica			present	present	common
Dinophysis rotundata					present
Lingulodinium polyedrum					present
Prorocentrum micans		common	present	present	
Protoceratium reticulatum			present		present
Protoperidinium depressum		present		present	
Protoperidinium oblongum			present	present	
Protoperidinium steinii				present	present
Protoperidinium spp.	present				present
Scrippsiella complex	present	present			present
Dictyoca fibula	present		present		
Anabaena spp.[1]				0.01	present
Nodularia spumigena [1]			0.02		present

The Baltic Sea

The first signs of surface accumulations of cyanobacterium were observed east of BY5. The accumulations looked like small grains. A surface sample was taken underway and analysis made clear that the filamentous cyanobacteria *N. spumigena** were present.

The accumulations persisted until BCS III-10. No clear accumulation was found north of BCS III-10 but surface samples and integrated samples contained relatively high abundance of *N. spumigena** and *Aphanizomenon* spp at all stations untill BY20 northeast of Gotland.

No accumulations were found west of Gotland or in the Kalmar sound. The occurrence of both *N. spumigena* and *Aphanizomenon* spp decreased going south and only a few filaments could be found at M1-V1. *Anabaena* spp. seemed however to increase going south and a small peak was observed at M1-V1. Only a few filaments of *N. spumigena** were noted in surface samples at Hanö bight.

Arkona Basin BY2 and Bornholm Basin and BY5 29th of July
Aphanizomenon spp. was the most common of the cyanobacterium but *Nodularia spumigena** was also present. The diatom *Chaetoceros impressus was very common* at both BY2 and BY5.

South East Baltic BCS III-10 29th of July
Few species wer found in the integrated sample. The diatom *C. impressus* dominated. A chlorophyll fluorescence maximum was located at 15 meters containing the same species as the integrated sample except that a few filaments of the cyanobacteria genus *Aphanizomenon* were found. Both the cyanobacterium *Anabaena* spp. and *N. spumigena** were present in the integrated sample in low amounts and *N. spumigena** dominated at the surface.

Eastern Gotland Basin BY15 30th of July
The diatom *Chaetoceros impressus* dominated the sample. Several filaments of the cyanobacterium *N. spumigena** *Aphanizomenon* spp. and *Anabaena* spp. were present both in the surface and the integrated sample. The dinoflagellate *D. norvegica** as well as large filaments of *Aphanizomenon* spp. were found at the chlorophyll fluorescence maximum at 15 meters.

Western Gotland Basin BY 38 31th of July
Aphanizomenon spp., *N. spumigena** and *Anabaena* spp. were found in small amounts where *N. spumigena* dominated. A few individuals of the genus *Dinophysis** was found and a few other cells in a rather scars sample.

Kalmar Sound Ref. M1-V1 31th of July
The sample was thin and contained few species. The dinoflagellate *Heterocapsa triquetra* dominated. *Anabaena* spp. dominated the filamentous cyanobacterium but a

few filaments of *Aphanizomenon* spp. and *N. spumigena** were also found. Both *Dinophysis norvegica** and *D. acuminata** was present.

Phytoplankton analysis and text by:
Marie Johansen

Selection of observed species	**BY2**	**BY5**	**BCS III-10**	**BY15**	**BY38**	**Ref. M1-V1**
Red=potentially toxic species	**2009-07-29**	**2009-07-29**	**2009-07-29**	**2009-07-30**	**2009-07-31**	**2009-07-31**
[1] quantified in m/l	**cells/l**	**cells/l**	**cells/l**	**cells/l**	**cells/l**	**cells/l**
Chaetoceros impressus	3 300	4 000	present	3 700	present	present
Chaetoceros similis	present					
Chaetoceros spp.		present				present
Thlalassiosira spp.	present	present				
Ceratium tripos		present				
Dinophysis acuminata						present
Dinophysis norvegica	present			present	present	present
Dinophysis rotundata				present	present	
Gonyaulax spp.		present	present	present		
Gymnodiniales			present			present
Heterocapsa triquetra		present		present		common
Anabaena spp. [1]			present	present	present	present
Aphanizomenon spp. [1]				0.8	present	present
Nodularia spumigena [1]	present	present	present	1,2	1,2	present

Surface sampling using a bucket.	**Observations of the following filamentous cyanobacteria:**		
Station:	***Aphanizomenon* spp.**	***Nodularia spumigena****	***Anabaena* spp.**
BY2		present	
BY4	present		
BY5	present	present	
East of BY5		present	
BCS III-10		present	
BY10	common	present	present
BY15	present	present	present
BY20	common	present	present
BY32	present	present	present
BY38	present	present	present
Hanö bight		present	
Ref M1 V1	present	present	common

Art / Species	Gift / Toxin	Eventuella symptom	Clinical symptoms
Alexandrium spp.	Paralytic shellfish poisoning (PSP)	**Milda symptom:** Inom 30 min.: Stickningar eller en känsla av bedövning runt läpparna, som sprids gradvis till ansiktet och nacken; stickningar i fingertoppar och tår; Huvudvärk; yrsel, illamående, kräkningar, diarré **Extrema symptom:** Muskelförlamning; andningssvårigheter; känsla av att kvävas; Man kan vara död inom 2-24 timmar efter att ha fått i sig giftet, på grund av att andningsmuskulaturen förlamas.	**Mild case:** Within 30 min: tingling sensation ro numbness around lips, gradually spreading to face and neck; prickly sensation in fingertips and toes; headake, dizziness, nausea, vomiting, diarrhoea. **Extreme case** Muscular paralysis; pronounced respiratory difficulty; choking sensation; death trough respiratory paralysis may occur within 2-24 hours after ingestion.
Dinophysis spp.	Diarrehetic shellfish poisoning (DSP)	**Milda symptom:** Efter cirka 30 minuter till några timmar: yrsel, illamående, kräkningar, diarré, magont **Extrema symptom:** Upprepad exponering kan orsaka cancer	**Mild case:** Within 30 min-a few hours: dizziness, nausea, vomiting, diarrhoea, abdominal pain. **Extreme case:** Repeated exposure may cause cancer.
Pseudochattonella spp.	Fish toxin	**Låg celltäthet:** Ingen påverkan. **Hög celltäthet:** Fiskens gälar skadas, fisken dör.	**Low cell numbers:** No effect on fish. **High cell numbers:** Fish death due to gill damage.
Chaetoceros concavicornis	Mechanical damage through hooks on setae	**Låg celltäthet:** Ingen påverkan. **Hög celltäthet:** Fiskens gälar skadas, fisken dör.	**Low cell numbers:** No effect on fish. **High cell numbers:** Fish death due to gill damage.
Pseudo- niztschia spp.	Amnesic shellfish poisoning (ASP)	**Milda symptom:** Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramper **Extrema symptom:** Yrsel, hallucinationationer, förvirring, förlust av korttidsminnet, kramper	**Mild case:** Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. **Extreme case:** dizziness, hallucinations, confusion, loss of memory, cramps.