

Abstract

AlgAware number 7 is split in two parts because the July cruise is divided into two. This report, part 2, presents phytoplankton analysis from the Skagerrak, the Kattegat and the south-western part of the Baltic Proper.

Phytoplankton analyses have partly been made on board, partly on land, at the SMHI laboratory.

No surface accumulations were observed during the cruise. At the Bornholm Basin, BY4 and BY5, and in the Hanö Bight, cyanobacteria flakes were seen in the water. Some filaments of the cyanobacteria *Aphanizomenon flos-aquae* were found at BY2, Bornholm basin, in the integrated samples (0-10m).

To follow the surface accumulations of cyanobacteria in the Baltic Sea by satellite interpretations: <http://www.smhi.se/en/Weather/Sweden-weather/the-algae-situation-1.11631>

The Swedish West coast and the southern Baltic Sea

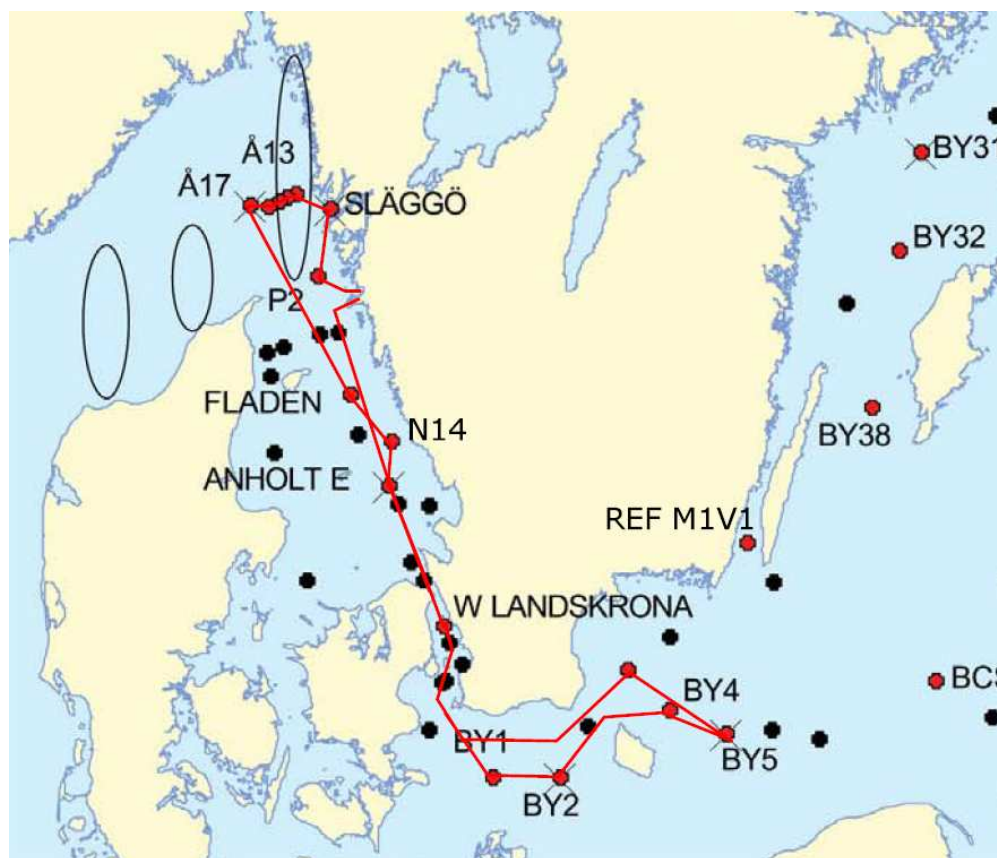


Fig 1. The red line shows the cruise route

The Skagerrak

Short summary of fluorescence maxima in the Skagerrak

At station P2 (Skagerrak coast), a very diverse phytoplankton sample was found at 30 meters where the chlorophyll fluorescence peaked. The dinoflagellate genus *Ceratium* dominated, and numerous other species were present, diatoms, dinoflagellates and other classes too. The water was nutrient rich at 30 meters and almost depleted above this depth.

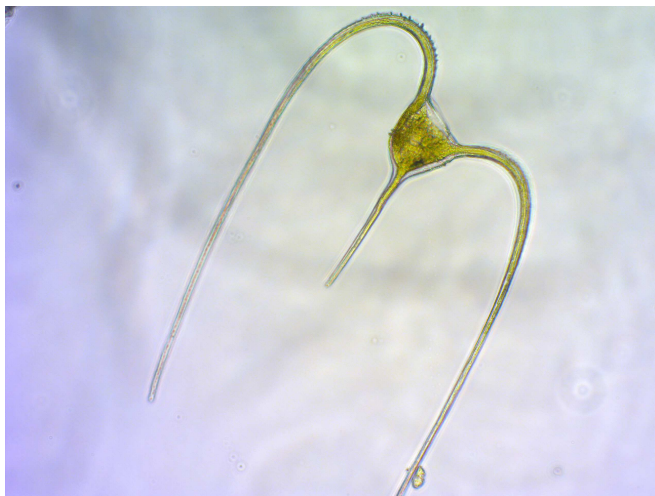
At the Skagerrak Å-section from Å13, closest to the coast to Å17, fluorescence peaks were present between 20 to 30 meters.

Å17 (open Skagerrak) 30th of July

The species diversity was quite high but total cell numbers low. Small flagellates of different sorts were most common. Cells belonging to prymnesiophyceae were dominating. The toxic dinoflagellate *Dinophysis norvegica* was also found in relatively high amounts.

Släggö (Skagerrak coast) 30th of July

The species diversity was quite low at this station. The cell abundance was moderate but mainly small cells were found in the sample. The coccolithophore *Emiliana huxleyi* was for example found in higher amounts.



The dinoflagellate *Ceratium macroceros* is a typical North Sea species. It was abundant in the fluorescence peak samples from the Skagerrak area.

The Kattegat

N14 Falkenberg 31st of July

The species diversity was moderate but total cell numbers low. Small flagellates were most common such as cells belonging to prymnesiophyceae. The coccolithophore *Emiliana huxleyi* was found in moderate amounts.

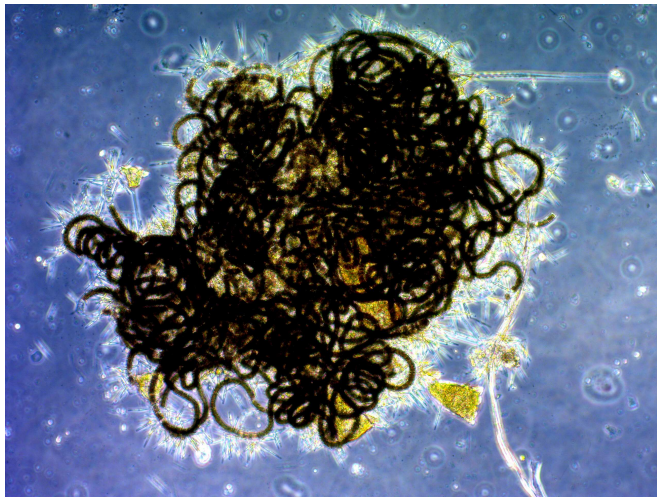
Anholt E 31st of July and Anholt E 2nd of July

The species diversity and total cell numbers were low on both occasions. Small cells dominated and cells belonging to prymnesiophyceae were most common on both occasions.

The Southern Baltic Sea

Short summary of surface samples in the south-western Baltic.

Cyanobacteria flakes were visible in the water at the Bornholm Basin, BY4 and BY5 and in the Hanö Bight. Microscope analysis revealed that the flakes were pale, pigment poor, aggregations of *Nodularia spumigena*, on which an ecosystem of diatoms, dinoflagellates and zooplankton were found. These aggregations are remnants from surface accumulations that have fallen apart and are beginning to sink to deeper depths.



Nodularia spumigena aggregation with diatoms and ciliates clinging on to it.

BY2 Arkona basin 1st of August

The species diversity was low. Mainly small flagellates were found in the sample. Different species belonging to the cryptomonadales dominated. Some filaments of the cyanobacteria *Aphanizomenon flos-aqua* was also present in the sample. Different ciliates were also found.

BY5 Bornholms deep 1st of August

The species diversity and total cellnumber were both low. Small cells mainly belonging to prymnesiales were found. Different ciliates were also found in relative high cellnumbers.

Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	2013-07-30	2013-07-30	2013-07-31	2013-07-31	2013-08-02
Hose 0-10 m	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Cylindrotheca closterium</i>					present
<i>Dactyliosolen fragilissimus</i>			present	present	present
<i>Leptocylindrus danicus</i>	present				
<i>Proboscia alata</i>				present	present
<i>Alexandrium</i> spp			present		
<i>Ceratium furca</i>	present				
<i>Ceratium fusus</i>	present				present
<i>Ceratium longipes</i>	present				
<i>Ceratium macroceros</i>	present				
<i>Ceratium tripos</i>	present		present	present	present
<i>Dinophysis norvegica</i>	present				
<i>Dinophysis rotundata</i>	present	present			
Gymnodiniales	present				
<i>Gymnodinium</i>	present		present	present	present
<i>Heterocapsa</i> spp		present	present	present	present
<i>Katodinium glaucum</i>	present	present			
<i>Lingulodinium polyedrum</i>			present		present
Peridinales	present	present	present	present	present
<i>Prorocentrum micans</i>		present	present		present
<i>Protoperdinium</i> spp	present		present	present	present
<i>Protoperdinium crassipes</i>	present				
<i>Protoperdinium divergens</i>			present		
<i>Protoperdinium steinii</i>			present		
<i>Scrippsiella</i> CPX	present				
<i>Dinobryon faculiferum</i>				present	
<i>Prymnesiales</i>	common	common	common	common	common
<i>Emiliania huxleyi</i>		common	common		
<i>Chlorodendrales</i>		present			
<i>Pyramimonas</i> spp	present	common	present	present	
Cryptomonadales	present	present	present	present	
<i>Leucocryptos marina</i>	present	present			present
<i>Plagioselmis prolunga</i>		common	present	common	common
<i>Teleaulax</i> spp	present	present			present
<i>Telonema subtile</i>	present				
<i>Helicostomella subulata</i>			present		
<i>Mesodinium rubrum</i>		present			
<i>Ciliophora</i> spp	present		present	present	present

Selection of observed species	BY2	BY5
Red=potentially toxic species	2013-08-01	2013-08-01
Hose 0-10 m	cells/l	cells/l
<i>Navicula</i> spp		present
<i>Mesodinium rubrum</i>	present	
<i>Cryptomonadales</i> spp	present	present
<i>Plagioselmis prolonga</i>	common	present
<i>Teleaulax</i> spp	common	present
<i>Pseudopedinella pyriforme</i>	present	present
<i>Ceratium tripos</i>	present	
<i>Gymnodinium</i> spp		present
<i>Peridinales</i>		present
<i>Ebria tripartita</i>	present	
<i>Chaetoceros impressus</i>	present	
<i>Pyramimonas</i> spp	common	present
<i>Prymnesiales</i>	present	common
<i>Ciliophora</i>	present	present
<i>Aphanizomenon flos-aquae</i>	present	

Art / Species	Gift / Toxin	Eventuella symptom	Clinical symptoms
<i>Alexandrium</i> 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 or numbness around lips, gradually spreading to face and neck; prickly sensation in fingertips and toes; headache, dizziness, nausea, vomiting, diarrhoea. Extreme case Muscular paralysis; pronounced respiratory difficulty; choking sensation; death through respiratory paralysis may occur within 2-24 hours after ingestion.
<i>Dinophysis</i> spp.	Diarrhetic 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.
<i>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	Milda symptom: Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramper Extrema symptom: Yrsel, hallucinationer, förvirring, förlust av kortidsminnet, kramper	Mild case: Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. Extreme case: dizziness, hallucinations, confusion, loss of memory, cramps.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	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.
<i>Pseudochattonella</i> 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.

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