Oceanographic Unit
No 7, August 2015

Algal situation in
Marine Waters surrounding Sweden

Sammanfattning

Denna rapport handlar enbart om Östersjön då SMHI följt med på den Finska expeditionen COMBINE 3 och rapporterar från deras provtagningsstationer inkluderande ett par tillägg av ordinarie stationer i det svenska programmet. Alla analyser har skett ombord på Aranda och fokus har varit att framförallt följa eventuella cyanobakterieblomningar och ytansamlingar.

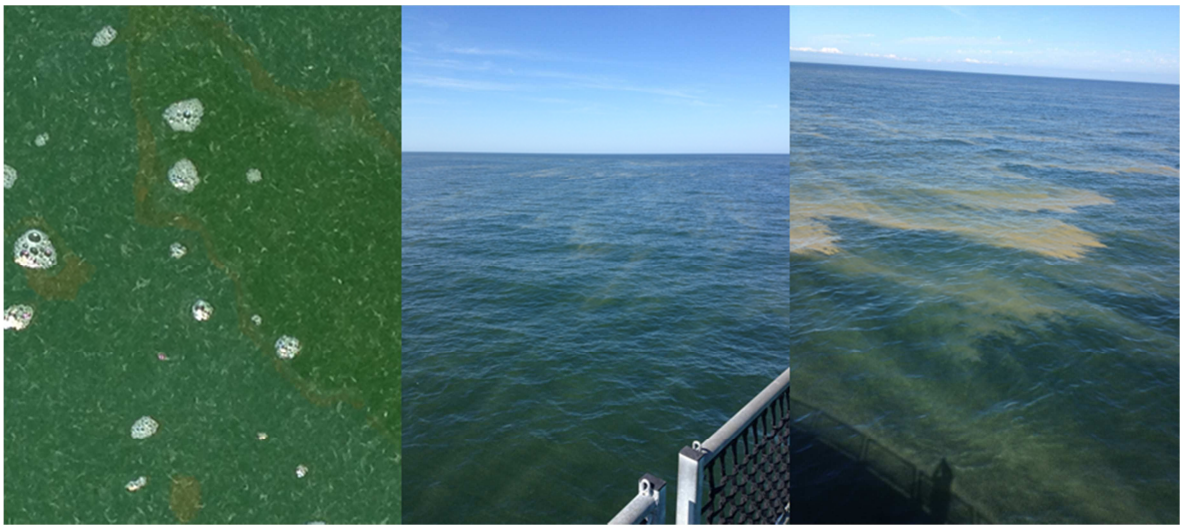

Fig.1 Different accumulations of cyanobacteria. Left picture shows grains. Picture in the middle show grains forming streaks and picture on the right present a fully developed surface accumulation.

Sammanfattning av ytansamlingar

Den varma luften samt de svaga vindarna som uppstod i veckan ledde till att mindre eller större aggregeringar av cyanobakterier som återfanns i hela det besökta området.Ett stort område med små aggregeringar av filamentösa cyanobakterier återfanns vid inloppet till finska viken och höll i sig mer eller mindre konstant till delarna av Östersjön öster om Gotland. De filamentösa cyanobakterierna *Aphanizomenon flos-aquae* samt *Nodularia spumigena* återfanns framför allt i stora mängder i nordöstra Egentliga Östersjön ända ner till söder om Gotland. Söder om Gotland minskade mängderna tillfälligt för att sedan öka igen. I vattnen mellan Öland och Gotland återfanns stora och ofta kraftiga ytansamlingar och däremellan återfanns cyanobakterier i form av korn i höga tätheter i hela övre vattenpelaren. Även norr om Gotland ovanför Landsort återfanns stora områden med ytansamlingar och däremellan korn.

För att se satellittolkningar av ytansamlingar av cyanobakterier:
http://www.smhi.se/vadret/hav-och-kust/algsituationen

Abstract

This report covers the Baltic Proper only as this expedition is reporting from the Finish cruise. All analyses have been performed onboard the ship and the main focus was to follow the cyanobacterial surface accumulations and blooms

Summary of surface accumulations

The warm air temperature and the light winds which occurred in the beginning of the week promoted small and larger aggregations of cyanobacteria throughout the area visited. A large area of small aggregations of filamentous cyanobacteria was found at the entrance to the Gulf of Finland and aggregations persisted more or less constant along the eastern parts of the Baltic Sea, east of Gotland. The filamentous cyanobacteria *Aphanizomenon flos-aquae* and *Nodularia spumigena* were found in large quantities in the northeastern Baltic all the way down to the south of Gotland. South of Gotland the concentrations dropped temporarily and then rose again. Large surface accumulations were noted in the waters between Öland and Gotland. Cyanobacterial grains in high densities were found throughout the upper water column. North of Gotland, above the Landsort Deep, surface aggregates were found and also large areas with grains in between the surface aggregates.

Please follow the link below to see interpretations of blooms from satellite images in the Baltic http://www.smhi.se/vadret/hav-och-kust/algsituationen

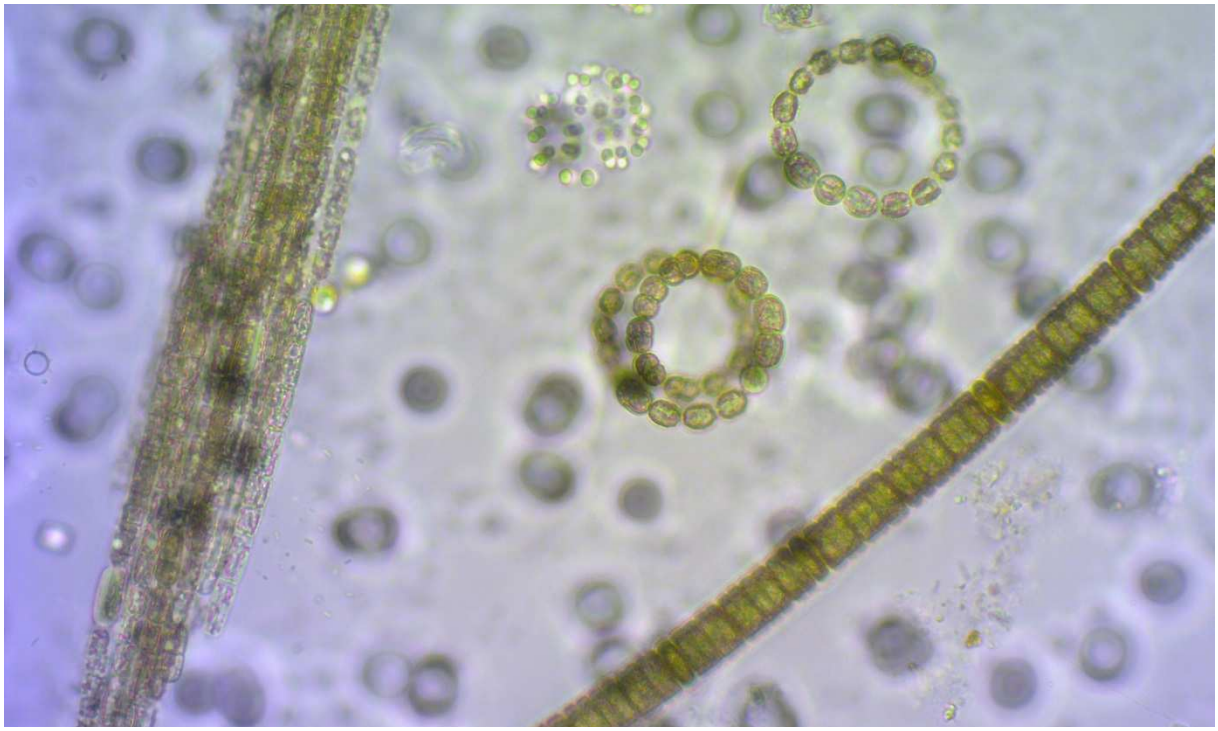

Fig 2. The three most common filamentous cyanobacteria found in the Baltic during summer. To the left is *Aphanizomenon flos-aqua* with several cellfilaments attached together. In the middle of the picture is the genus *Dolicoshermum* where cells often form jewelry like shapes. Down at the right bottom corner is *Nodularia spumigena.*

The Baltic Sea

Surface sampling with bucket and at some stations hose samples (0-10m).

LL12 and LL15 3rd and 4th of August

Small grains of cyanobacteria were visible at both stations the grains mainly consisted of the cyanobacteria *N. spumigena* and some *A. flos-aqua* and different species of the genus *Dolichospermum*

BY29 4th of August

Small grain sized aggregates of filamentous cyanobacteria was found in the water column close to the surface. The aggregates consisted of more or less equal amounts of *N. spumigena* and *A. flos-aqua*, some cells of the genus *Dolichospermum* was also present.

Quite a few different species of dinoflagelletas were present in the hose sample at this station for example *Heterocapsa triquetra* were common.

F79 and Wave 1 north and east of Gotland 4th and 5th of August

Two finish stations where surface water was collected. A little less lumps and grains of cyanobacteria were found and aggregates were still present in surface waters. The filamentous cyanobacteria *A. flos-aqua* was found in higher concentrations than *N.spumigena*.

BY15 5th of August

A lot of grains in surface waters and also streaks of aggregates where seen on and off in the water. The cyanobacteria were dominated by the possible toxin producer *N. spumigena* and lesser amounts of *A. flos-aqua* was also found.

From the the hose sample (0-10m) some different dinoflagellates were found together with different cyanobacterial picoplankton.

BCSIII4 South of Gotland and East of Öland 6th of August

The aggregates and streaks of surface accumulation found on the way to this station had dissolved a bit when reaching the station. Small grains were still present but in lower concentrations than before. The grains consisted mostly of the genus *Dolichospermum*.

BY38 6th of August

Large areas of surface accumulations were recorded between Öland and Gotland moving towards the station. High amounts of grain sized particles formed streaks and also large aggregates in between.

The integrated sample (0-10m) consisted of a quite diverse community. The dinoflagellates *Dinophysis norvegica* and *Heterocapsa triquetra* were both quite common.

BY32 7th of August

Small grains of cyanobacteria were found in the water but at lower concentrations than before. Equal amounts of *N. spumigena* and *A. flos-aqua* was found.

The integrated sample contained few species and cells except for the filamentous cyanobacteria.

LL23 Landsort deep 7th of August

Small grains of cyanobacteria was found but in low concentrations compared to other stations.

The integrated sample was diverse and contained dinoflagellates but also the diatom *Chaetoceros wighamii.*

Selection of observed species	BY29	BY15 Gotlandsdj	BY38 Karlsödj	BY32	LL23 Landsortsdj
Red=potentially toxic species	2015-08-04	2015-08-05	2015-08-06	2015-08-07	2015-08-07
Hose 0-present0 m	presence	presence	presence	presence	presence
Actinocyclus spp	present				
Chaetoceros wighamii					present
Cyclotella spp			present		
Thalassiosira spp	present				
Dinophysis acuminata	present				present
Dinophysis norvegica	present	present	common	common	common
Dinophysis rotundata		present	present		
Diplopsalis complex			present	present	
Gymnodiniales		present	present		
Gonyaulax spp		present			
Heterocapsa triquetra	common		common		very common
Peridiniales	present	present	present		
Protoceratium reticulatum					present
Scrippsiella complex					present
Dolichospermum spp			very common	common	common
Aphanizomenon flos-aquae	common	common	very common	common	common
Nodularia spumigena	common	common	common	common	common
Aphanocapsa spp	present		present		
Aphanothece spp	present	present			
Snowella spp	present	present	present	present	present
Woronichinia spp	present				present
Ebria tripartita		present	present	present	common
Oocystis spp		present	common		present
Planctonema lauterbornii		common	present	present	
Prymnesiales	present	present	present		present
Cryptomonadales	present	present	present		present
Pterosperma spp			present	present	
Ciliophora			present	present	
Helicostomella subulata	common	present			present

Surface samples sampled with bucket		Aggregations of Aphanizomenon flos aqua	Aggregations of Nodularia spumigena	Dolichospermum spp.
Station	Date			
LL12	03-aug	common	common	present
LL 17	04-aug	common	very common	present
BY29	04-aug	common	common	present
WAVE1	05-aug	common	present	present
BY15	05-aug	common	very common	present
BCSIII4	06-aug	common	common	common
BY38	06-aug	very common	very common	common
BY32	07-aug	common	common	present
LL23 (Landsortsdjupet)	07-aug	common	common	common
LL21	07-aug	common	common	common