

Newsletter July 2015

Dear Readers!

In this quarter's newsletter, we take a look at ...

- The 10cells on expedition across the North Atlantic Ocean
- bbe has started using the toximeters in salt water applications
 - salt water biomonitoring using *Moina salina* in the DaphniaToximeter II
 - salt water biomonitoring using *Dunaliella tertiolecta* in the AlgaeToximeter II

With our best regards,

bbe Moldaenke

The 10cells on expedition across the North Atlantic Ocean

10cells on expedition

10cells - the Ballast Water tester on cruise: bbe took part in a scientific expedition with the German research vessel "Meteor" in June 2015. The trip took 12 days, started in Cape Verde (Africa) and ended in Hamburg (Germany). One of the cruise's goals was to test different rapid testing methods for checking ballast water. The test conditions were very well prepared and 10cells performed well throughout.

Regulations will come into force soon: As the International Maritime Organisation (IMO) is ratified, ballast water may only contain a maximum of 10 living cells per ml in the size range of 10-50µm. Algae represent the greatest amount of biomass in ballast water. Therefore, they are an ideal parameter for ballast water quality control. bbe Moldaenke is one of the leading manufacturer of algae measuring devices. With over 20 years' experience in this field, bbe has developed a high sensitive Ballast Water Testing Device: the 10cells. The measuring principle is based on the natural fluorescence of algal cells, but we have greatly improved the sensitivity using a modified PAM method. The 10cells is able to identify down to one living cell per ml. Thus, it's 10 times more sensitive than required by IMO regulations. The sensitivity can be enhanced over a great range by increasing the amount of filtered water. Additionally, the 10cells is light-weight, easy to handle and takes less than 1 minute per measurement.

Using this new device, ballast water check is very easy, fast, safe and on-site.

The Ballast Water Testing Devices were also tested with seawater next to the ballast water samples during the expedition across the Atlantic Ocean.

In Mindelo's harbour water, there were only few microorganisms for port conditions - 30 cells/ml in the size range of 10-50µm. If this water had been ballast water, it would not have needed to be treated according to IMO. The amount of microorganisms was under 1 cell/ml water outside of the harbour, due to low nutrient load. If this water had been ballast water, it would not have needed to be treated according to IMO.

The 10cells was able to detect both statuses positively. Using the 10cells, users are able to determine the amount of cells in the ballast water, even down to one cell per ml.

10cells in practice

One Ballast Water Treatment System and different Ballast Water Testing Devices were tested on the expedition with the German research vessel "Meteor".

The tested Ballast Water Treatment System was used with different settings. This resulted in different algae concentrations in the ballast water. The 10cells was able to determine these conditions and showed the according algae concentrations in the sample water.

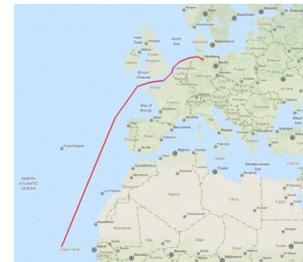
When using 10cells, ship owners and port authorities are able to check very easily and fast how reliably a Ballast Water Treatment System works.



bbe 10cells for ballast water testing



German research vessel "Meteor"



Expedition route

Salt water biomonitoring using *Moina salina* in the DTox II

Moina salina is a salt water flea and belongs to the same class of crustaceans like *Daphnia magna*, which is typically used for toxicity tests. Actually the *M.salina* is suitable for online-measurements with the bbe DaphniaToximeter II too. In contrast to *D. magna*, *M. salina* is highly adaptable to salinity but prefers salt content between 3 and 3.5 %.

The cameras of the DaphniaToximeter II are able to detect the smaller *Moina salina* and the software is able to adapt itself to the slightly different swimming behaviour compared to *Daphnia magna*. *Moina salina* extends the use of the bbe DaphniaToximeter II for toxicological assessment in marine water.





bbe DaphniaToximeter II



Moina salina



Screenshot of DTox II using Moina salina

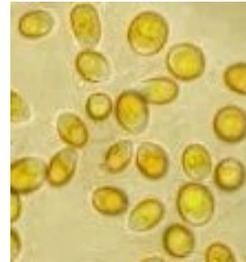
Salt water biomonitoring using *Dunaliella tertiolecta* in the AlgaeToximeter II

Dunaliella tertiolecta is a marine flagellate belonging to green algae (Chlorophyta). It is a fast-growing strain and relatively simple to cultivate. Additionally it does not clump or form chains.

All these qualities make *Dunaliella tertiolecta* easy to grow and apply in the bbe AlgaeToximeter. But most importantly *Dunaliella tertiolecta* has proven (both in test by bbe and in literature) to be sensitive to different toxins, what makes it suitable for toxicological assessment in saline water.



bbe AlgaeToximeter II



Dunaliella tertiolecta



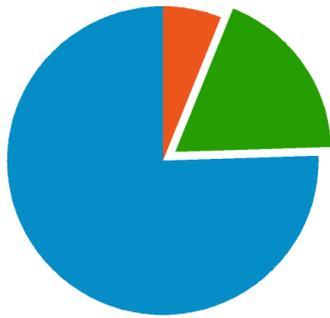
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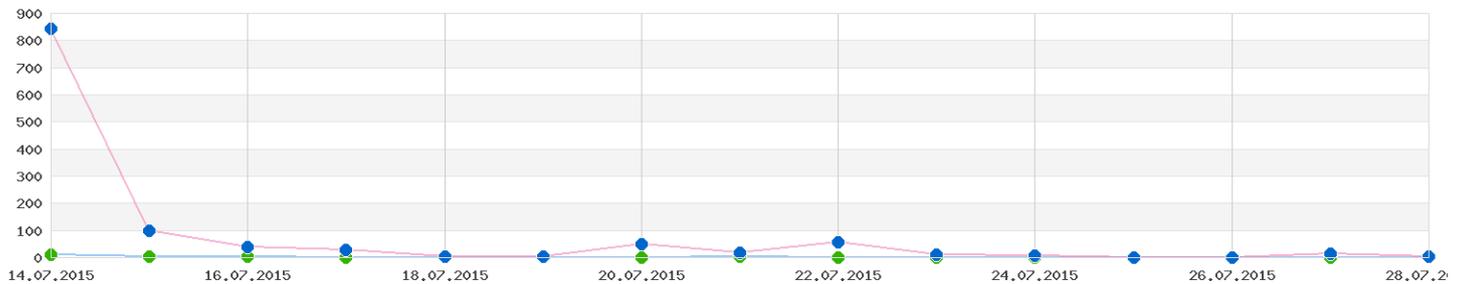
Übersicht



Öffnungen	468	19,72% Öffnungsrate 1223 insgesamt
Bounces	152	6,02% unzustellbar
Ungeöffnet	1.905	80,28% nicht geöffnet
Klicks	17	3,63% Klickrate 22 Klicks insgesamt
Abmeldungen	6	0,25% Abmelderate

Empfänger	2.525
Ausgeliefert	2.373
Bounces	152
Einzelne Öffnungen	468
Alle Öffnungen	1.223
Einzelne Klicks	17
Alle Klicks	22
Bestellungen	0
Umsatz	0,00 EUR
Conversion-Rate	0,00%

"Öffnungen und Klicks"



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2.	http://www.bbe-moldaenke.de/toxicity/daphniatoximeter/	4	20,00%
3.	http://www.bbe-moldaenke.de/toxicity/algaetoximeter/	4	20,00%
4.	http://www.10cells.com/welcome/	3	15,00%