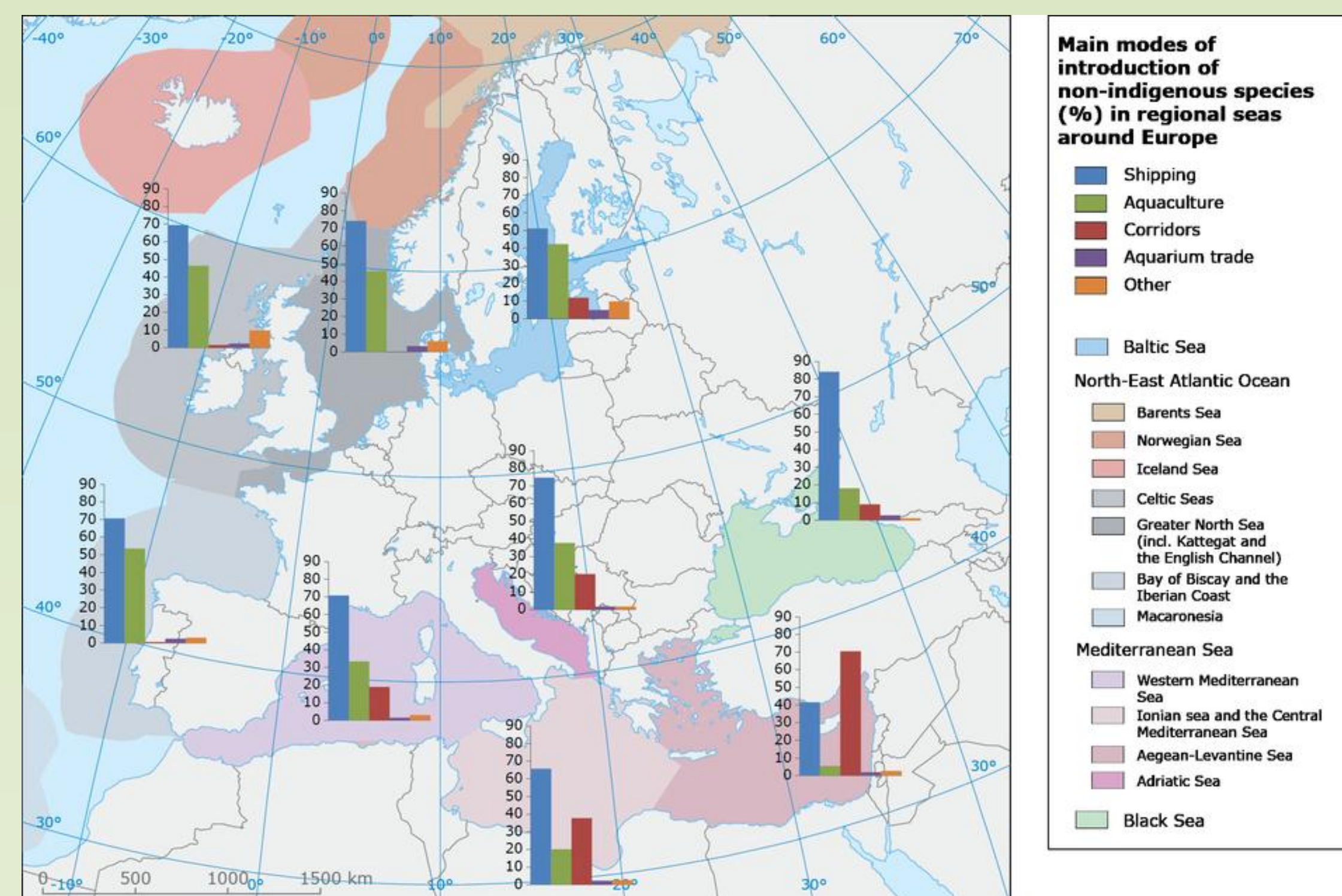


Using *In Vivo* Fluorescence Detection to Verify Ballast Water Compliance

Lawrence Younan Applications Scientist, Turner Designs

The Problem

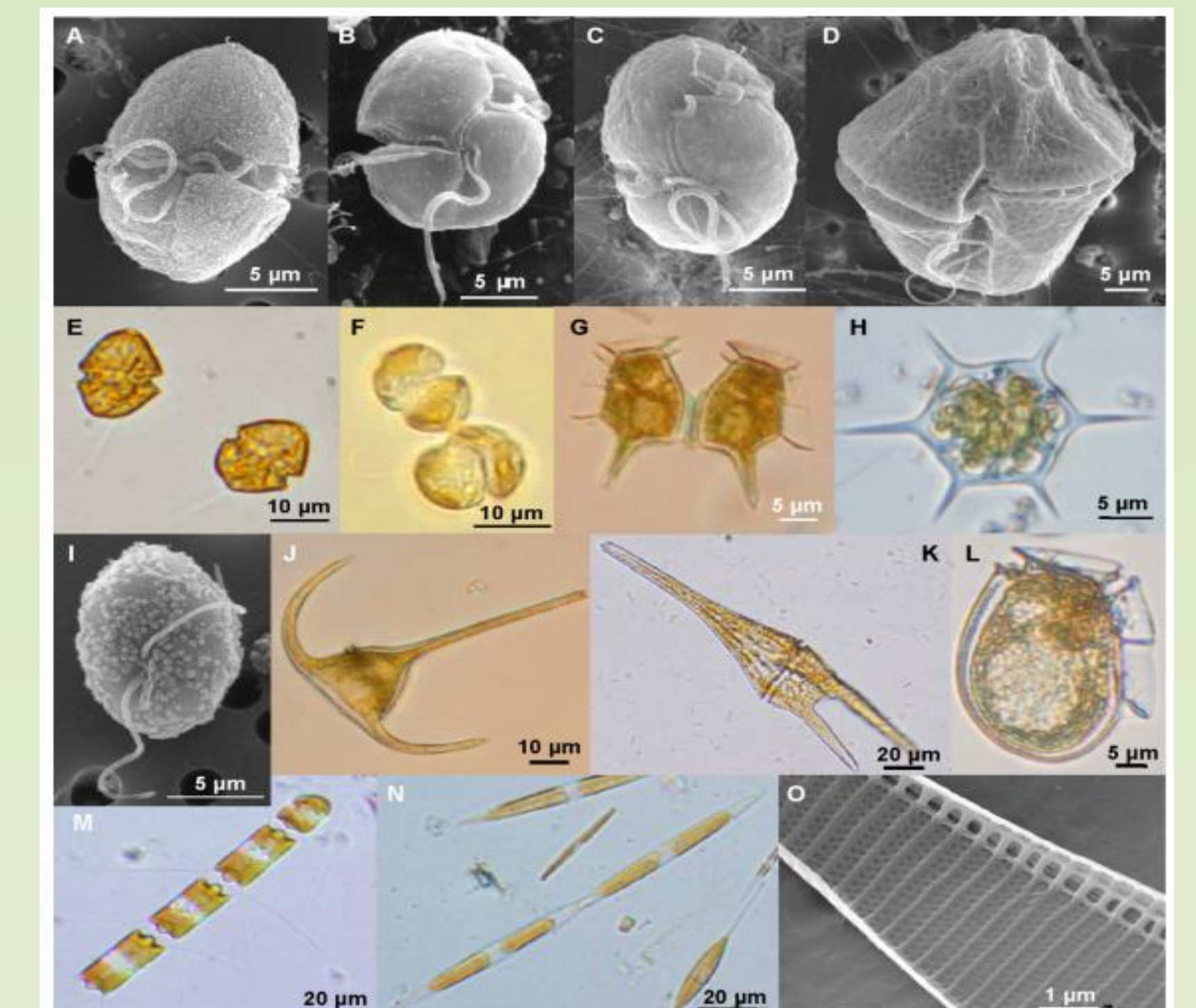
Increase in aquatic invasive species transported via shipping through ballast water.



HCMR DataBase (not online) provided by Hellenic Centre for Marine Research (HCMR)



<http://www.safety4sea.com/updated-bwts-list-accepted-by-the-uscg/>



J.A.M. Burkholder et al. / Harmful Algae 6 (2007) 486–518

The Regulation

IMO D2 discharge standard specifies allowable limits for viable organisms of various size classes in discharged water. Indicative measures look at the 10-50 micron size specification, which is less than 10 viable organisms per ml.

The Requirement

Indicative methods to determine compliance levels must be easy to use, have good precision and accuracy, indicate whether ballast water is in or out of compliance with standards.

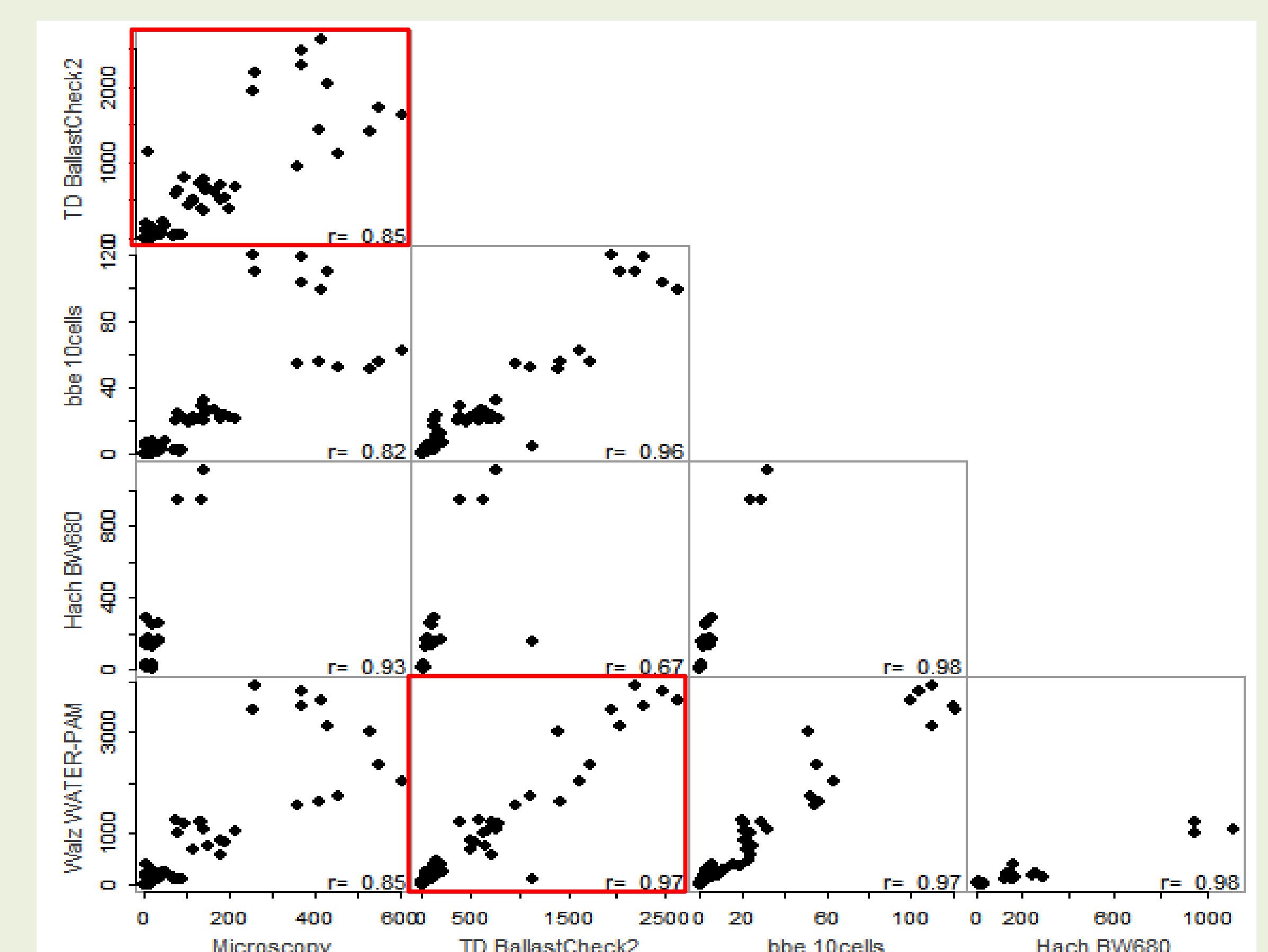
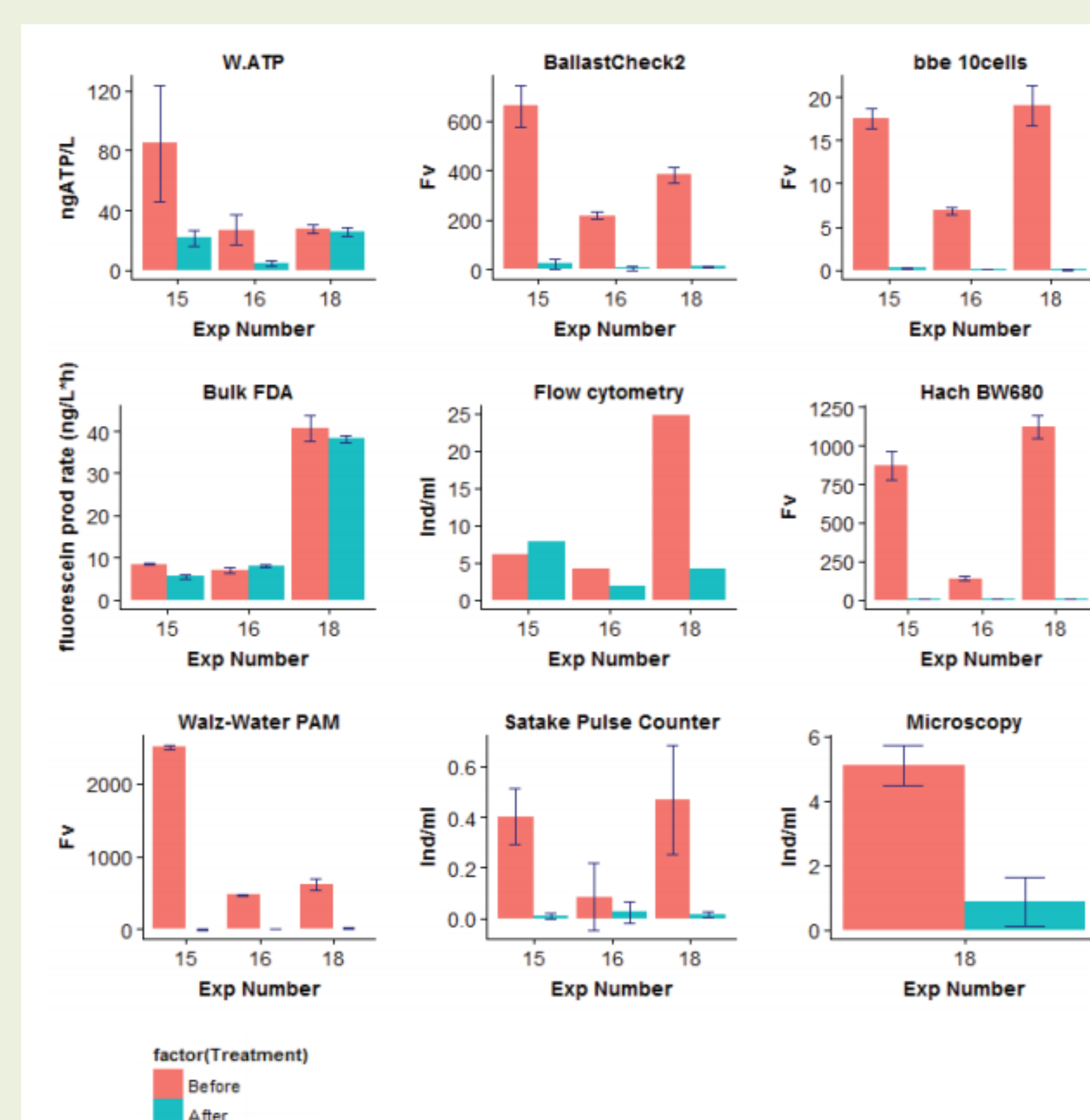
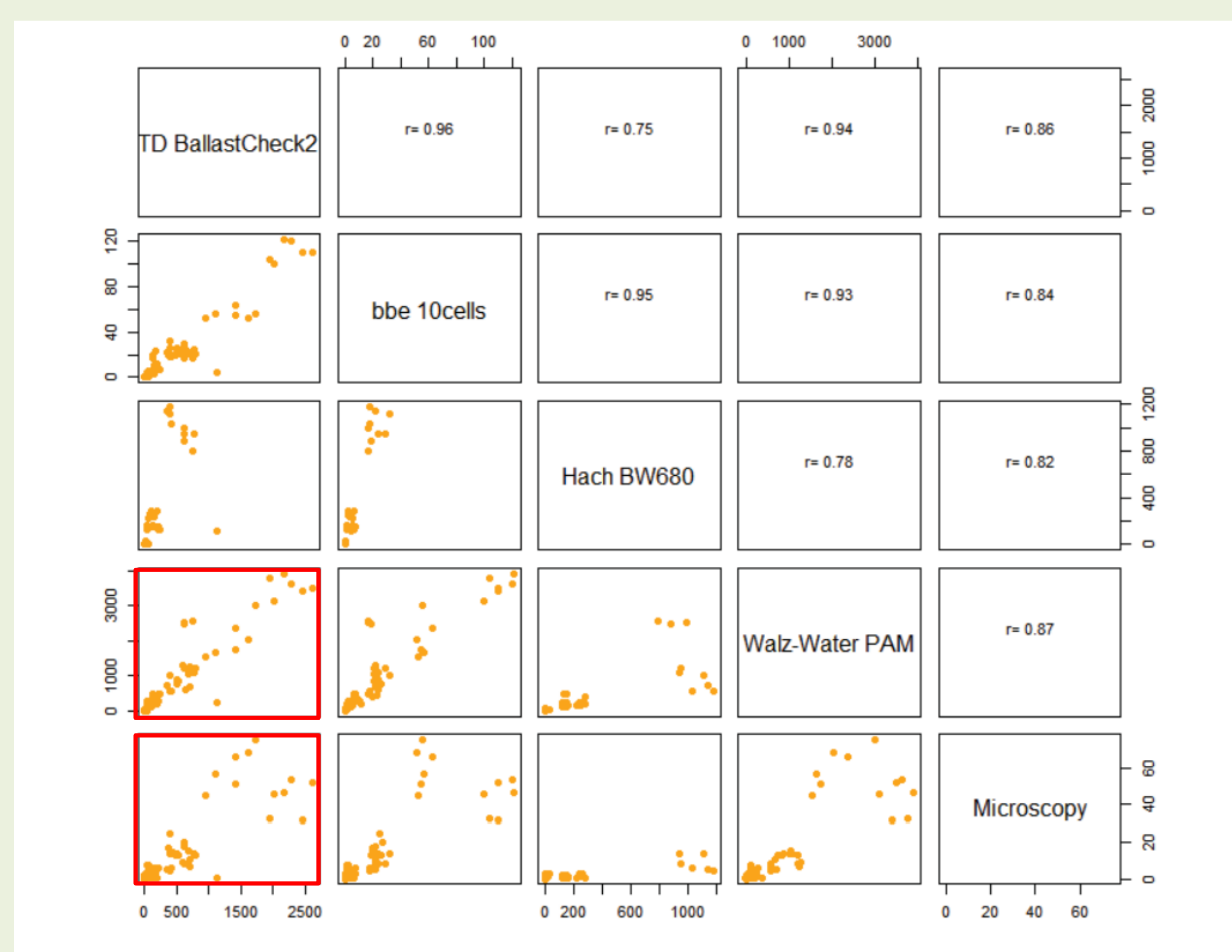


The Technology

Fluorometric analysis of ships' ballast water to provide cell count estimates of the 10-50 micron size class and determine organism viability in a compact, rapid (less than 1 minute), easy to use, low cost package.

The Result

This method shows strong correlation with highly analytical and ground truth methods (microscopy) for over 600 samples analyzed aboard the RV Meteor for treated and non-treated ballast water samples.



<http://www.bsh.de/de/Meeresdaten/Umweltschutz/ReBaT-Projekt/ReBaT-Projekt.pdf>

Summary

Ballast-Check 2 was developed using innovative optoelectronics allowing for a high degree of sensitivity without the typical problems associated with this type of measurement, such as instrument drift due to moving parts or changes in the optical components. Ballast-Check 2 is a very stable and sensitive instrument that can be used by ship operators and crew, port state officials, or regulatory officers with results that are easy to read and understand for quick indicative analyses for testing compliance of ballast water.