

MIRAI MR15-04 Photosynthetic Pigments

Last Modified: 2018-09-14

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Cruise ID: [MR15-04](#)

Photosynthetic Pigments: Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

Observation Items: photosynthetic pigment

Science Keywords:

OCEANS > OCEAN CHEMISTRY > CHLOROPHYLL
BIOSPHERE > AQUATIC ECOSYSTEMS > PLANKTON > PHYTOPLANKTON
BIOSPHERE > ECOLOGICAL DYNAMICS > ECOSYSTEM FUNCTIONS > PHOTOSYNTHESIS

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR15-04_all.pdf

For Using Data

Principal Investigator

Masaki Katsumata (JAMSTEC)

JAMSTEC / BPPT joint cruise in the Indonesian waters.

Use Constraints

See [Terms and Conditions](#) about constrain of use.

Data Citation

See [Terms and Conditions](#) about data citation.

Instrument

Instrument:

High-performance liquid chromatography (MR10-04 Leg1 -)



Outline of water sampling, incubation, and analysis

- 1) Vertical sampling : Niskin
- 2) Surface sampling : Bucket
- 3) Sampling layer : 11
- 4) Filter and filtration : Whatman GF/F 47mm was used at dark place.
- 5) Freezing and drying : -20degC, 5 hours
- 6) Extract reagent : N,N-dimethylformamide (HPLC-grade)
- 7) Extract time : -20degC, 24 hours
- 8) Preservation period of frozen filter paper : a few days
- 9) Analysis place : MIRAI
- 10) Analysis device : High-performance liquid chromatography (HPLC)
- 11) Stationary phase : YMC C8 column, 150×4.6mm, 35degC
- 12) Mobile phase (unit in volume ratio):
Eluant A: methanol : acetonitrile : aqueous pyridine (0.25M pyridine) = 50 : 25 : 25
Eluant B: methanol : acetonitrile : acetone = 20 : 60 : 20
- 13) Analysis pigment number : 24 pigments (see cruise report)

About High-performance liquid chromatography (HPLC) and its utilization in MIRAI

High-performance liquid chromatography (HPLC) is a kind of column chromatography to separate, identify, and quantify individual chemical compounds from mixtures of compounds by a difference of chemical attractions with the column's stationary phase. High pressure to propels the mobile phase allow for a better separation resolution and sensitivity than ordinary column chromatography.

In MIRAI, HPLC are used for separating and quantifying various phytoplankton pigments in natural seawater. Taxonomic composition of phytoplankton can be estimated by measuring composition of their pigments. In this cruise, reversed phase C8 Columns and pyridine are used as stationary and mobile phases, respectively, based on a method of Zapata et al. (2000). More pigments can be separated by using C8 column than C18 column which was conventionally used. Pyridine used as a mobile phase is suitable for a better separation of phytoplankton ingredients such as carotenoids and chlorophylls.

Specifications of High-performance liquid chromatography

Manufacturer: Agilent Technologies, Inc.

Instruments type: Agilent1200 modular system

G1311A Quaternary pump (low-pressure mixing system)

G1329A auto-sampler

G1315D photodiode array detector

Pigment detection and identification:

Pheophorbide a, Pheophytin a : 409nm

Chlorophyll a : 431nm

[3,8-Divinyl]-Protochlorophyllide : 440nm

Chlorophyll b : 462nm

Others : 450nm

Reference material

Chlorophyll a : Sigma-Aldrich Co.

trans-β-Apo-8'-carotenal (Internal standard) : Sigma-Aldrich Co.

Other 24 pigments : DHI co.

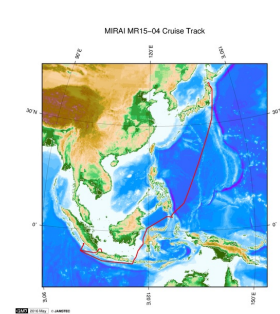
Reference

Zapata, M., Rodriguez, F. and Garrido, J. L. (2000), Separation of chlorophylls and carotenoids from marine phytoplankton: a new HPLC method using a reversed phase C8 column and pyridine-containing mobile phases, Mar. Ecol. Prog. Ser., 195, 29-45.

About this data

- 1) In this cruise, there is extra data (size fractionated pigment concentration) in addition to photosynthetic pigment data that has been opened to the public. Please contact us from "Contact Us" above if necessary.
- 2) There are some description error for photosynthetic pigment data of this cruise. Please refer to the errata of the cruise report.

Related Information



[Enlarge Image](#)

MR15-04

Ship Name: MIRAI

Period: 2015-11-05 - 2015-12-20

Chief Scientist: Masaki Katsumata (JAMSTEC)

Proposal ▶ Observational study of the heavy rain zone in the tropical eastern Indian ocean

Title:

Update History

2018-09-14	An observation data was registered.
2018-01-13	An observation data was registered.
2017-12-31	An observation data was registered.

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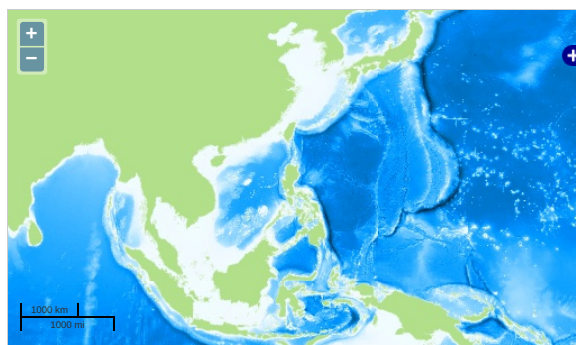
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Observation Map



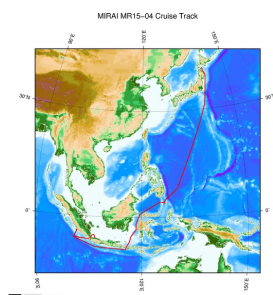
... Observation Line ... Navigation ... Observation, Dive Point, Hole

Data List

File names

☐ MR15-04_hplc.csv

Related Information



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