

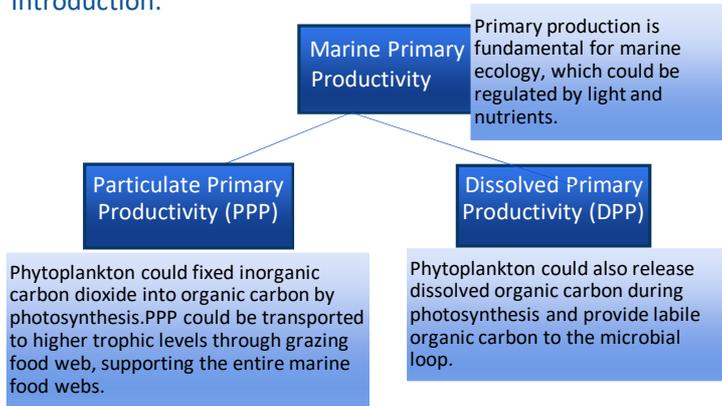


Differences Nitrogen Source Effect on Particulate and Dissolved Primary Production : An Experimental Design

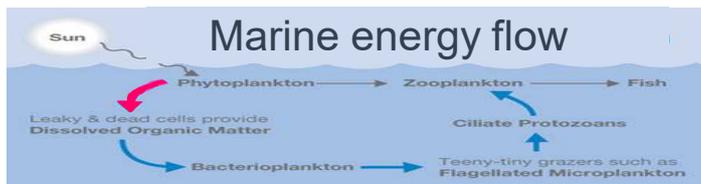
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Introduction:



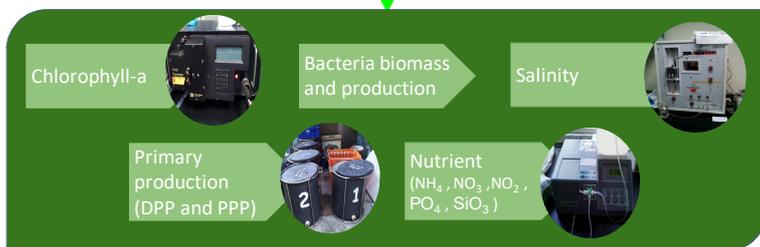
$$\text{Percentage Extracellular Release (PER)} = \text{DPP} / (\text{DPP} + \text{PPP})$$



Methods:

Control	Treatment 1	Treatment 2	Treatment 3
Seawater (blank)	Seawater + NH ₄ Cl (final conc. 2 μM)	Seawater + KNO ₃ (final conc. 1 μM) + NH ₄ Cl (final conc. 1 μM)	Seawater + KNO ₃ (final conc. 2 μM)

Measured variables



Location:



Background:

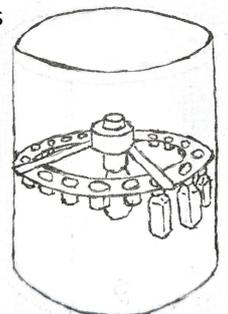
- ※ Varela et al. (2005) found that different nitrogen sources (ammonium and nitrate) will affect PER
- ※ The percentage of extracellular dissolved organic nitrogen (DON) release (PER_N) was related to nitrogen uptake from different nitrogen source
- ※ Using nitrate as the nitrogen source : PER_N 42±3.1%
- ※ Using ammonium as the nitrogen source : PER_N 22±2.1%

Goal:

To test if the percentage of extracellular dissolved organic carbon (DOC) release (PER_C) is controlled by difference nitrogen sources.

Photosynthesis-Irradiance Experiments

- ☉ Primary production was determined by the ¹⁴C assimilation method (Parsons et al., 1984)
- ☉ Samples incubated at different photosynthetically active radiation (PAR) levels
- ☉ After incubation PPP subsamples were collected on GF/F filters, while DPP subsamples of 5 mL were collected as the filtrate passing through a 0.22-μm membrane
- ☉ After HCl acidification on GF/F filters and into 0.22-μm filtrate, scintillation cocktail were added to subsamples counted on liquid scintillation counter.



Expected result:

- ✗ DPP : Treatments > Control
- ✗ PPP : Treatments > Control
- ✗ PER_C : Treatment 3 > Treatment 2 > Treatment 1

Preliminary Results :

Environmental variables

		Exp I	Exp II
Date		Jun 8, 2020	Jul 9, 2020
Temperature	° C	26.5	28
Salinity	(psu)	35.993±0.003	36.181±0.052
Chl-a	(mg m ⁻³)	0.128±0.033	0.130±0.015
Nitrate	(μM)	1.97±0.06	1.40±0.00
Nitrite	(μM)	0.21±0.01	0.12±0.02
Phosphate	(μM)	0.20±0.01	0.18±0.05
Silicate	(μM)	3.13±0.06	2.13±0.22

Validation for nitrate concentrations (μM)

	Exp I		Exp II	
	Expected	Real	Expected	Real
T1	1.97	2.17±0.06	1.40	1.47±0.15
T2	2.97	2.90±0.00	2.40	2.17±0.23
T3	3.97	3.97±0.15	3.40	3.07±0.40

Reference:

Varela, M., Bode, A., Fernandez, E., Gonzalez, N., Kitidis, V., Varela, M., and Woodward, E. (2005) Nitrogen uptake and dissolved organic nitrogen release in planktonic communities characterised by phytoplankton size-structure in the Central Atlantic Ocean, Deep-Sea Res. I, 52: 1637–1661

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