1 SOMBA cruise

SOMBA GE cruise took place during summer 2014 (from august 14th to September 10th) on "Téthys II" oceanographic vessel (CNRS-INSU). The cruise was divided into 4 legs and included 70 hydrological stations, which cover the whole Algerian basin (Fig. 1). The stations were distributed in a way to have six (06) north-south sections and a large west-east section (850 km, from the west-southern of Sant' Antioco Island to the south of Cartagena). The location of these stations were also defined in order to revisit the stations of anterior cruises in order to deduce temporal evolutions of the biogeochemical parameters.

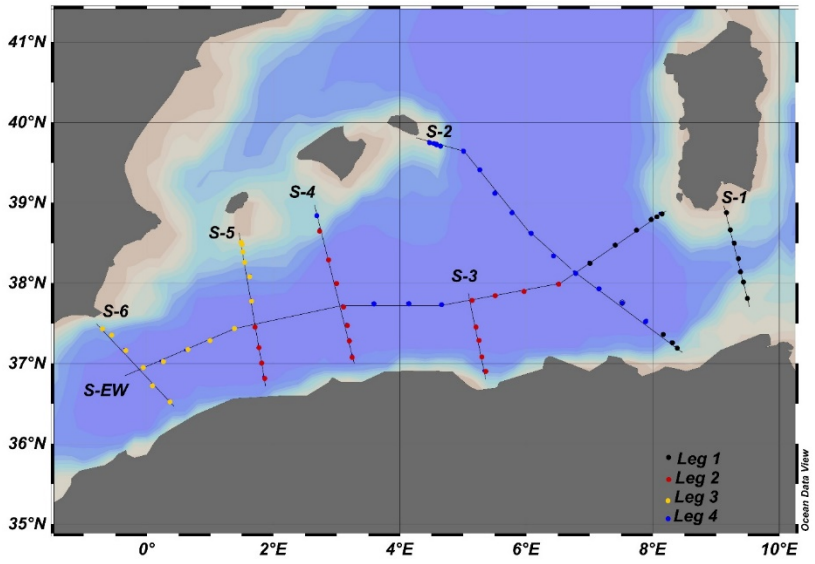

Figure 1: The distribution of the sampled stations in the Algerian basin (SOMBA 2014): 1st, 2nd, 3rd and 4th legs are in black, red, yellow and blue respectively. Solid black lines show the seven corresponding sections

2 Sampling strategy and Measurements protocols

The 70 visited stations were sampled for hydrological parameters from the surface to the bottom over eleven depth levels using Niskin Bottles of 12 L. At each depth, water samples were either analyzed on board (dissolved oxygen) or fixed and stored to a later analysis (DIC, nutrients, salinity). At each station, a CTD cast was also deployed to acquire a continuous profile of hydrological, current and bio-optical parameters over the water column (Table 1).

2.1 Nutrients

Nutrients samples were collected in 15ml acid-washed plastic vials at all hydrographical stations and poisoned immediately with mercuric chloride. The measurements were conducted by an automatic colorimetric procedure with a Technicon Auto Analyzer (Tréguer et LeCorre, 1975) in MIO Laboratory. Calibrations were also performed for each station using standard solutions covering the range of concentrations of each element. The precision of the nitrite, nitrate, orthophosphate and silicic acid measurements were 2%, 3-5%, 3-5% and 5% respectively, while the limits of quantification were 0.03µM, 0.05µM, 0.02µM and 0.05µM respectively. For more precautions, nutrient concentrations less than 0.02µM have been neglected.

2.2 Dissolved oxygen

Dissolved oxygen was measured continuously by a SBE43 oxygen sensor associated with daily discrete measurements by Winkler potentiometric method modified by Longdon (2010), which served as calibration points using seabird calibration technics. A total of 31 duplicates were sampled, over 12 stations, at different depths. A duplicate was also sampled in two different bottles for the same depth. The reproducibility exercises resulted in an estimated precision of 1.56µmol/kg.

2.3 Pigments

Pigments samples were collected over half of the hydrographical stations by sampling 05 depth levels in the first 100m and a dark level. Surface sampling was concentrated around the DCM in order to follow phytoplanctonique community development in this area of biomass maximum. Samples were filtered then frozen in liquid nitrogen (-80°C) until analysis. Measurements were conducted in the LOV (Laboratoire d'Oceanographie de VilleFranche) by HPLC technic. The analytical procedure is described in Ras et al. (2008).

2.4 Carbonate parameters measurement

Carbonate system parameters were sampled in 500ml borosilicate glass vials (222 samples) then poisoned with 100µl of a saturated mercuric chloride solution ($HgCl_2$), following the recommendations of the Standard Operating Procedures n°1 (Dickson et al., 2007). Twelve (12)

duplicates were sampled. In order to better estimate the precision of the sampling procedure, a duplicate was also sampled from two different bottles for a same depth. Samples were then transported to the SNAPO-CO_2 Laboratory (Paris-France) and stored in a cold room until analyses, which took place from the 08th to the 17th October 2014. The DIC and TA were measured by a potentiometric method, using a closed-cell titration, based on Edmond (1970) method and uses the non-linear least squares procedure for equivalent point determination, described by the Standard Operating Procedures n°3a of (DOE, 1994).

The repeatability is expressed by the short-term standard deviation, which corresponds to 1.985µmol/kg and 3.286µmol/kg for TA and DIC, respectively. Temporal drifts of chloric acid and the accuracy were corrected using Dickson Certified Reference Materials (CRM) provided by the University of California- San Diego (batch 139; TA=2250.82±0.6µmol/kg, DIC=2023.23±0.7µmol/kg). Two batches per day were used, which corresponds to one batch for 14 samples.

Table 1: Measurement methods and procedures

Parameter	Measurement method	Apparatus	Measurement location	Operators
Continuous measurements CTD-Rosette (Sea-Bird SBE911+) with 11 Niskin bottles of 12L				
Temperature	02 temperature sensors	Thermometer	In-situ	Vincent Taillandier / Nadira Aït-Ameur
Salinity	02 conductivity sensors	Conductimeter	In-situ	
Dissolved oxygen	Oxygen Sensor	Oxygen sensor SBE43	In-situ	
Pigments	Fluorescence	Fluorimeter Chelsea Acquatracka (optical sensor)	In-situ	
Transmittance	Optical method	Transmissiometer WET Labs C-Star (optical sensor)	In-situ	
Current		02 ADCP / SADCP	In-situ	Hervé Legoff / Matthieu Labaste
Discrete measurements				
Pigments	HPLC	HPLC 1200	LOV (Laboratoire Océanographique de Ville-Franche)	Hervé Claustre/ Joséphine Ras
Dissolved oxygen	Winkler potentiometric method	Automatic titrator (Metrohm)	On ship	Mohamed Zerrouki
Nutrients	Automatic colorimetric procedure (Tréguer et LeCorre, 1975)	Auto Analysor Technicon	MIO (Mediterranean Institut of Oceanography)	Patrick Raimbault/ Benyahia Boudjellal

Parameter	Measurement method	Apparatus	Measurement location	Operators
TA/DIC	Potentiometric method (DOE, 1994)	Closed-cell	SNAPO-CO_2 (Service National d'Analyse des paramètres océaniques du CO_2)	M. Herbal/ C. Mignon/ J. Fin / Mehdia Keraghel

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