Final project report

<i>Project ID: Title:</i>	2002/8.6 The Victoria Land coastal ecosystem: structure and distribution along a latitudinal gradient
Principal investigator:	Riccardo Cattaneo-Vietti
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Duration:	2 years
Assigned funding:	€ 74.998 (100%first year)

Activities and results

An oceanographic cruise was performed in the framework of the project in january-february 2004 aboard of R/V Italica (2nd leg of the oceanographic campaign), addressed to study the latitudinal gradient effects on coastal marine communities and populations between Cape Adare and Terra Nova Bay.

The project is made up of Italian Universities and other Italian research institutions (CNR, Stazione Zoologica di Napoli, ISPRA) as well as foreign ones (National Institute of Water and Atmospheric Research of New Zealand, State University of California-Monterey, Alfred Wegener Institute-Bremerhaven and Seville University).

In the same time and a little northward, the R/V Tangaroa from NZ Ministery of Fisheries performed another survey in order to evaluate fish biodiversity and biomass. Three italian reasearchers took part to this cruise to study biodiversity and some biochemical and genetic traits of fish and benthic fauna.

Aboard of Italica, particular attention was paid to:

1) water column structure (temperature, salinity, fluorescence, nutrients, particulate and dissolved organic matter)

2) structure of pelagic communities (bacterioplankton, phytoplankton, holoplankton and meroplankton), of micro-, macro- and fish communities (within 400-500 m depth), identifying key species and their ecological role (distribution, occurrence, density and function)

3) benthic community structure, together with a description of the seafloor, producing 3D maps of the seafloor at the investigated areas in order to relate community structure and geomorphological features of the seafloor and iceberg scouring

4) genetic variability and possibile biochemical and physiological adaptations in key species (sponges, molluscs, crustaceans, echinoderms, fish) relative to the gradient.

In Italy samples collected durino the joint Italica and Tangaroa cruises were analysed. Molluscs, echinoderms and crustaceans all the samples were processed and organisms classified to the finest resolution.

Water column depth profiles were analysed; data were validated and fluorescence probe was calibrated with laboratory chlorophyll data. Water samples were processed. On the dissolved fraction (<0,45µm) analyses were performed in order to assess macronutrient concentrations (nitrites, nitrates, phosphates and silicates, Hansen & Grasshoff 1983), and as much as the organic compounds, total dissolved organic carbon was quantified (Sharp et al 1993, Thomas et al 1995) and biochemical characterisation was performed (proteins, Bradford 1976, and carbohydrates, Dubois et al 1956). On the particulate fraction carbon and nitrogen concentrations were assessed (Hedges & Stern 1984) and biochemical characterisation was performed as well (proteins, Hartree 1972, and carbohydrates, Dubois et al. 1956).

Finally, a preliminary analysis of mesozooplankton was performed, clssifying and counting main taxonomic groups.

Products

A – papers in scientific magazines

- Berkman P.A., R. Cattaneo-Vietti, M. Chiantore, C. Howard-Williams, V. Cummings, R. Kvitek (2005). Marine research in the Latitudinal Gradient Project along Victoria Land, Antarctica. Scientia Marina, 69 (Suppl. 2): 57-63
- De Domenico F., M. Chiantore, S. Buongiovanni, M. P. Ferranti, S. Ghione, S. Thrush, V. Cummings, J. Hewitt, K. Kroeger, R. Cattaneo-Vietti (2006). Latitude versus local effects on echinoderm communities along the Victoria-Land (Ross Sea, Antarctica). Antarctic Science, 18(4): 655-662
- 3. Guidetti M., S. Marcato, M. Chiantore, T. Patarnello, G. Albertelli, R. Cattaneo-Vietti (2006). Adamussium colbecki population structure in the Ross Sea. Antarctic Science, 18(4): 645-653.
- 4. La Mesa M., R. Cattaneo-Vietti, M. Vacchi (2006). Species composition and distribution of the Antarctic plunderfishes (Pisces, Artedidraconidae) from the Ross Sea off Victoria Land. Deep-Sea Research, Part II: Topical Studies in Oceanography, 53 (8-10): 1061-1070.
- 5. Povero P., M. Castellano, N. Ruggieri, L. Monticelli, V. Saggiomo, M. Chiantore, M. Guidetti, R. Cattaneo-Vietti (2006). Water column features and their relationship with sediments and benthic communities along Victoria Land Coast (Ross Sea, summer 2004). Antarctic Science, 18(4): 603-613.
- 6. Schiaparelli S., K. Linse (2006). A reassessment of the distribution of the common Antarctic scallop Adamussium colbecki (Smith, 1902). Deep-Sea Research II, 53: 912–920.
- 7. Schiaparelli S., Lörz A.N., Cattaneo-Vietti R. (2006) Diversity and distribution of mollusc assemblages on the Victoria Land coast and the Balleny Islands, Ross Sea, Antartica. Antarctic Science, 18 (4): 615–631.
- Schiaparelli S., C. Ghirardo, J. Bohn, M. Chiantore, G. Albertelli, R. Cattaneo-Vietti (2007). Antarctic associations: the parasitic relationship between the gastropod Bathycrinicola tumidula (Thiele, 1912) (Ptenoglossa: Eulimidae) and the comatulid Notocrinus virilis Mortensen, 1917 (Crinoidea: Notocrinidae) in the Ross Sea. Polar Biology, 30: 1545–1555.
- 9. Smith W.O., D.J. Ainley, R. Cattaneo-Vietti (2007) Trophic interactions within the Ross Sea continental shelf ecosystem. Philosophical Transactions of the Royal Society, series B: 362: 95-111.
- Thrush S., P. Dayton, R. Cattaneo-Vietti, M. Chiantore, V. Cummings, N. Andrew, I. Hawes, S. Kim, R. Kvitek, A.Maree Schwarz (2006) Broad scale factors influencing the biodiversity of coastal benthic communities of the Ross Sea. Deep-Sea Research Part II, 52: 959-971.
- 11. Utevsky S.Y., A.Y. Utevsky, S. Schiaparelli, P. Trontelj (2007) Molecular phylogeny of the fish leech subfamily Pontobdellinae and its role in the descent of fish leeches (Piscicolidae: Hirudinea). Zoologica Scripta, 36 (3): 271-280.
- 12. Heilmayer O., C. Honnen, U. Jacob, M. Chiantore, R. Cattaneo-Vietti, T. Brey (2005). Temperature effects on summer growth rates in the Antarctic scallop, *Adamussium colbecki. Polar Biology*, 28: 523-527.
- Schiaparelli S., M. Oliverio, M. Taviani, H. Griffiths, A.N. Loerz, G. Albertelli (2008) Circumpolar distribution of the pycnogonid-ectoparasite gastropod *Dickdellia labioflecta* (Dell, 1990) (Mollusca: Zerotulidae). *Antarctic Science*, 20 (5), 497-498.

B – book chapters

C - proceedings of international conferences

D – proceedings of national meetings and conferences

- E thematic maps
- F patents, prototypes and data bases

G – exhibits, organization of conferences, editing and similar

H - formation (PhD thesis, research fellowships, etc.)

PhD theses

- 1. AA 2003-04. Marta Guidetti. *Adamussium colbecki:* dinamica di popolazione, condizioni riproduttive e variabilità genetica. Dottorato di Ricerca in Scienze Polari, XVI ciclo, Università degli Studi di Siena
- 2. AA 2005-06. Francesca de Domenico. Biodiversità ed ecologia degli Echinodermi della Terra Vittoria (Mare di Ross). Dottorato di Ricerca in Scienze Polari, XIX ciclo, Università degli Studi di Siena

Research units

1. R.U. Mariachiara Chiantore Dipteris – University of Genoa, Corso Europa, 26 – 16132 Genoa

Research task: Population structure and dynamics of some key benthic species and their adaptative features.

Involved investigators: Giancarlo Albertelli Riccardo Cattaneo-Vietti Marta Guidetti Stefano Schiaparelli Giada Franci Simone Bava Antonio Sarà

2. R.U. Paolo Povero

Dipteris – University of Genoa, Corso Europa, 26 – 16132 Genoa

Research task: Physical and biological processes of water masses. Organic matter and plankton community structure *Involved investigators:* Tecla Sartorio Zunini Mario Petrillo Cristina Misic Michela Castellano

3. R.U. Giorgio Bavestrello

Department of Marine Sciences, Polytechnic University of Marche, Via Brecce Bianche -60131 Ancona **Research task**: Biological interactions in biological communities *Involved investigators:* Carlo Cerrano Barbara Calcinai Stefania Puce

4. R.U. Marino Vacchi ISPRA- Rome

Research task: Structure and trophic role of ichthyoplankton and fish fauna *Involved investigators:* Silvio Greco Mario La Mesa Massimo Dalù

5. R.U. Luis Monticelli

CNR – Thalassographic Institute of Messina

Research task: Structure, dynamics and enzymatic activity of microbial communities *Involved investigators:* Luis Monticelli Filippo Azzaro

6. R.U. Maria Cristina Gambi Stazione Zoologica di Napoli – Laboratorio del Benthos Ischia Porto Research task: Structure and dynamics of benthic photophilous communities *Involved investigators:*

Francesco Patti

Date: 26/06/09