



Laboratory of Experimental Ecology

<http://www.ecology.unibo.it/>

* Via Tombesi Dall'Ova 55, 48100 Ravenna, Italy
Tel. +39 0544 213831 Fax +39 0544 31204

§ Via dell'Agricoltura 5, 48100 Ravenna, Italy
Tel. +39 0544 454901 Fax +39 0544 455118

MAIN RESEARCH AREAS

- Ecology of coastal habitats, including rocky reefs, submarine caves, coastal lagoons and human-made structures
- Experimental analysis of the roles of physical and biological processes in maintaining spatial and temporal patterns in natural assemblages
- Fluxes of sediments and environmental impact of enhanced sediment loads
- Biodiversity and conservation of coastal assemblages
- Assessment of environmental consequences of urbanization in coastal areas
- Design and analysis of ecological experiments
- Integrated coastal management, EIA and risk assessment, biotic indexes of environmental quality
- Effects of natural and anthropogenic disturbances on benthic assemblages
- Evolutionary ecology and adaptive strategies in coastal and estuarine invertebrates
- Secondary production and trophic structure in macrobenthos
- Application of population dynamic models to aquatic ecotoxicology

RESEARCH PROJECTS

DELOS, EUMAR, BIOMARE (see posters on International Networks)
BAIONA (see poster on Integrated Projects)

The variability of hard substrate assemblages as a tool to estimate anthropogenic effects on coastal marine environments. COFIN 2002 financed by the Italian Ministry of Education and University - Principal investigator Laura Airoidi (ongoing)

The variability of natural systems reflects many ecological processes that differently affect patterns of species distribution according to the spatial scale of observation. Due to this variability, the generalisation of unreplicated small-scale studies is unreliable. The possibility of carrying out large-scale studies to discriminate the sources of natural variability from those induced by human activities is the prerequisite to understand both the effects of pollutants and the efficacy of protection over an area, as is the case of Marine Protected Areas. This research project aims (1) to quantify natural patterns of distribution of hard-substrate sessile assemblage at a hierarchy of spatial scales and (2) to set up proper monitoring protocols for the study of these assemblages along all Italian coasts. Studies deal with assemblages relevant for their biodiversity and which have been identified as indicators of anthropogenic and climatic effects by previous studies. The research units have jointly developed efficient and rapid sampling techniques so as to provide a basis for a large-scale monitoring network of marine coastal systems.



'Tegnùe' di Chioggia monitoring project Financed by the Regione Veneto - Principal investigator Massimo Ponti (ongoing)

'Tegnùe' are rocky outcrops emerging from the muddy and sandy bottoms of the northern Adriatic Sea. These structures are hosting an incredible reach and diverse marine life. In the year 2003 the Associazione Tegnùe di Chioggia, in collaboration with our lab, ICRAM (Stazione Idrobiologica di Chioggia), the Università di Padova (Dept of Biology) and the CNR (Institute of Marine Science of Venice) obtained by the Italian Government the creation of a "Zona di Tutela Biologica" to protect this unique environment. Following the institution of the ZTB, the Regional Government of Veneto funded a 3 years research project for the monitoring of the area. The Tegnùe are affected by both natural (e.g. anoxic crisis) and anthropogenic (e.g. trawling, diving) disturbance. Analysing patterns of distribution of species provides the basic knowledge for identifying and understanding ecological processes that shape natural assemblages and to apply the best available methodology for the conservation purposes. The potential role of habitat heterogeneity in influencing the composition and distribution of species of algae and animals will be assessed. These data provide the necessary background to evaluate the efficiency of the protection measures applied and to improve the management strategies.



Beach nourishment using underwater sand: assessment of impacts on coastal benthic assemblages. Financed by the Regione Emilia Romagna - Principal investigators Marco Abbiati and Francesco Colosio (ongoing)

Coastal erosion is one of the major issues that the Regional Environmental Agency (ARPA) has been facing during the last decades. In the year 2002 a large project for the nourishment of several beaches of Romagna, using sand excavated from the deep-water banks has been carried on. This approach is considered to be effective in protection from coastal erosion, with a limited impact on the coastal assemblages. However, deep-water sand differs from coastal sand in both the geological and ecological features. Deep water-sand has a larger grain size and a different composition in terms of shell debris and associated living fauna. This project aims to quantify changes in coastal species assemblages due to beach nourishment, both in areas protected by breakwaters and on the open coast. The final goal is to develop an optimal impact study design to be used in a BACI assessment (Before vs After/Control vs Impact) in future beach restoration projects.



CADESSES - Management and sustainable development of protected transitional waters. Submitted to the EU European Community Initiative INTERREG III B - Principal investigator Marco Abbiati (submitted)

The project is designed to improve and reinforce conservation of natural heritage in protected transitional ecosystems through functional networking and promotion of pilot actions, enlarging fruition of economic and social components. The strategic objective are: (1) to overcome fragmentation of expertise and activities on protected transitional ecosystems in the CADESSES area, by networking scientific, socio-economic and decision-maker components; (2) to translate the efforts on conservation into sustainable development strategies, creation of new jobs opportunities and improvement of quality of life. To reach its aims and to achieve its strategic objectives the project has a number of specific objectives, which are organized into the following areas: environmental, socio-economic, and networking-communication.



SELECTED PUBLICATIONS

(listed by year of publication)

- Airoidi L** (2003) The effects of sedimentation on rocky coast assemblages *Oceanogr Mar Biol Annu Rev* 41: 161-236
- Airoidi L** (2003) Effects of patch shape in intertidal mosaics: roles of area, perimeter and distance from edges. *Mar Biol* (in press)
- Anderson MJ, Willis TJ** (2003) Canonical analysis of principle coordinates: a useful method of constrained ordination for ecology *Ecology* 84: 511-525
- Bacchiocchi F, Airoidi L** (2003) Structure, distribution, and dynamics of epibiota on different typologies of coastal defence works *Estuar Coast Shelf Sci* 56: 1157-1166
- Chapman MG, Bulleri F** (2003) Intertidal seawalls - new features of landscape in intertidal environments *Landscape Urban Plan* 62: 159-172
- Cristoni C, Colangelo MA, Ceccherelli VU** (2003) Spatial scale and meiobenthic copepod recolonisation: testing the effect of disturbance size in a seagrass habitat *J. Exp. Mar. Biol. Ecol.* (in press)
- Pasteris A, Vecchi M, Reynoldson TB, Bonomi G** (2003) Toxicity of copper-spiked sediments to *Tubifex tubifex* (Oligochaeta, Tubificidae): a comparison of the 28-day reproductive bioassay with a 6-month cohort experiment *Aquatic Toxicology* 65: 253-265
- Virgilio M, Barotini M, Trombini N, Abbiati M** (2003) Relationships between sediments and faunal contamination and algal blooms in *Hadula diversicolor* (Polychaeta: Nereididae) in the Pialassa laguna (North Adriatic sea) *Oceanol Acta* 26: 85-92
- Willis TJ, Miller RB, Babcock RC** (2003) Protection of exploited fishes in temperate regions: high density and biomass of snapper *Pagrus auratus* (Sparidae) in northern New Zealand marine reserves *J Appl Ecol* 40: 214-227
- Willis TJ, RB Miller, RC Babcock, N Tolmieri** (2003) Burdens of evidence and the benefits of marine reserves: putting Descartes before the horse? *Environ Conserv* 30: 97-103
- Bulleri F, Bertocci I, Micheli F** (2002) Intertidal of encrusting coralline algae and sea urchins in maintaining alternative habitats *Mar Ecol Prog Ser* 243: 101-109

- Ponti M, Abbiati M, Ceccherelli VU** (2002) - Drilling-platforms as artificial reefs: distribution of macrobenthic assemblages of the "Paguro" wreck (northern Adriatic Sea) *ICES J Mar Sci* 59: S316-S323
- Abbiati M, Basset A** (2001) Ecological research and conservation of coastal ecosystems *Aquat Conserv* 11: 233-234
- Benedetti-Cecchi L, Pannacchiulli F, Bulleri F, Moschetti PS, Airoidi L, Reolini G, Cinielli F** (2001) Predicting the consequences of anthropogenic disturbance: large-scale effects of removing dominant species on rocky shores *Mar Ecol Prog Ser* 214: 137-150
- Santangelo G, Abbiati M** (2001) Red coral: conservation and management of an overexploited Mediterranean species *Aquat Conserv* 11: 253-259
- de Wit R, Stal LJ, Lormstein BA, Herbert RA, van Gernerden H, Vioroli P, Ceccherelli VU, Rodriguez-Valera F, Bartoli M, Giordani G, Azzoni R, Schaub B, Welsh DT, Donnelly A, Cifuentes A, Anton J, Finster K, Nielsen LB, Pedersen AGU, Neubauer AT, Colangelo MA, Heijs SK** (2001) ROBUST: The Role of Buffering capacities in Stabilising coastal lagoon ecosystems *Cont Shelf Res* 21: 2021-2041
- Airoidi L** (2000) Effects of disturbance, life-histories and overgrowth on coexistence of algal crusts and turfs *Ecology* 81: 796-814
- Benedetti-Cecchi L, Bulleri F, Cinielli F** (2000) The interplay of physical and biological factors in maintaining mid-shore and low-shore assemblages on rocky coasts in the north-west Mediterranean *Oecologia* 123: 406-417
- Cognetti G, Lardicci C, Abbiati M, Castelli A** (2000) The Adriatic Sea and the Tyrrhenian Sea in C Sheppard (Ed): *Seas at the Millennium - An Environmental Evaluation*, Vol. 1, pp.267-284. Elsevier Science Ltd, London
- Mistri M, Ceccherelli VU, Rossi R** (2000) Taxonomic distinctness and diversity measures: responses in lagoonal macrobenthic communities *Ital J Zool*, 67, 2000, pp. 297 - 301
- Vecchi M, Reynoldson TB, Pasteris A, Bonomi G** (1999). Toxicity of copper-spiked sediments to *Tubifex tubifex* (Oligochaeta, Tubificidae): a comparison of the 28-day adult reproductive bioassay with an early life stage bioassay *Environ Toxicol Chem* 18: 1173-1179

STAFF

Tenures

Prof. Marco Abbiati, (abbiati@ambra.unibo.it, *)
Prof. Victor Ugo Ceccherelli (victor.ceccherelli@unibo.it, *)
Dr Marina Antonia Colangelo (marina@ambra.unibo.it, *)
Dr Andrea Pasteris (andrea.pasteris@unibo.it, *)

Post doctoral fellow

Dr Laura Airoidi (lairoldi@ambra.unibo.it, *)
Dr Fabio Bertasi (fbertasi@ambra.unibo.it, *)
Dr Fabio Bulleri (fbulleri@ambra.unibo.it, *)
Dr Norma Lopez (nlopez@ambra.unibo.it, *)
Dr Massimo Ponti (ponti@ambra.unibo.it, *)
Dr Massimiliano Virgilio (mvirgilio@ambra.unibo.it, *)
Dr Trevor Willis (willis@ambra.unibo.it, *)

PhD student

Francesca Bacchiocchi (backy@ambra.unibo.it, *)
Francesca Bertozzi (fbertozzi@ambra.unibo.it, *)
Federica Costantini (fcostantini@ambra.unibo.it, *)
Cristian Mugnai (ilmugno@tin.it)
Romina Passaro (rpassaro@ambra.unibo.it, *)

Researcher assistants

Giovanna Branca (giobranca@hotmail.com, *)
Marcello Carrera (limello@hotmail.com, *)
Francesco Colosio (colosio.francesco@tiscalinet.it, *)
Gianni Gregorio (ggregorio@comune.ra.it, *)
Selvaggia Santin (ssantin@ambra.unibo.it, *)

Master students

Matteo Badiali, Chiara Casselli, Matteo Cossu, Amedeo Di Paolantonio, Elena Gamba, Amedeo La Morgia, Sara Lunghi, Stefano Maci, Laura Olivieri, Simona Tessili, Eleonora Torricelli, Sandra Lista

Visiting Scientists and major International Collaboration

Prof P. Åberg, Dept. of Marine Ecology, Göteborg University, Sweden
Dr M.J. Anderson, Dept. of Statistics, University of Auckland, New Zealand
DSc T.A. Britayev, A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Science, Moscow, Russia
Dr Waleed Hamza, Biology Dep., United Arab Emirates University.
Prof S.J. Hawkins, Director, Marine Biological Association UK, Plymouth, UK
Dr P. Johnson, Tjärnö Marine Biological Laboratory, Göteborg University, Strömstad, Sweden
Prof G.A. Kendrick, School of Plant Biology, University of Western Australia - Perth Australia
Dr D. Martin, Director, Centre d'Estudis Avançats de Blanes (CSIC), Girona, Catalunya, Spain
Prof J.S. Gray, Biology Institute University of Oslo, Norway
Dr D.C. Rodriguez Vargas, Laboratorio de Fisiología, Departamento de Biología Comparada, Universidad Nacional Autónoma de México, México
Dr T.B. Reynoldson, National Water Research Institute, Environment Canada
Prof D. Terlizzi, Center of Marine Biotechnology, University of Maryland - Baltimore, USA

FACILITIES

Laboratory equipment: microscopes and binoculars, Nikon and video cameras, personal computers and image analyser, oven, muffle, thermostats, sieves column, Sartorius and Millipore filtering systems, equipment for electrophoresis, PCR, centrifuges, Microtox, incubators and aquaria

Filed work equipment: aluminium and inflatable boats, Nikonos cameras, Underwater digital camcorder, diving equipments, GPSs, rangefinder, box corer, van Veen, Ponar and Ekman grabs, corers, Idronaut CTD, pH-meters, refractometers, conductivity meters, oxymeters



MEDCOAST-03