

CURRICULUM VITAE – PROF. GIANLUCA SARA' (PH.D. 1994)

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NAME: Gianluca SARA'

SEX: Male

DATE OF BIRTH: May 19th, 1965

NATIONALITY: Italian



CURRENT POSITION

Associate Professor of Ecology

Laboratory of Experimental Ecology & Behaviour (LoEEB) @ University of Palermo (Italy),
Department of Earth and Marine Science, Viale delle Scienze, Ed. 16, I-90128 Palermo
(Italy)

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EDUCATION AND PROFESSIONAL APPOINTMENTS

2012 Provost Award Fellowship April-May 2012 (8 weeks) - University of South Carolina, USA

2010 Associate Professor, Ecology, Univ. of Palermo, Italy

2004 Assistant Professor, Ecology, Univ. of Palermo, Italy

1994 Senior technician and adjunct professor of Ecology, Conservation, Ecology, Marine Biology at University of Palermo, Italy

1994 Contract-researcher at the Ecology Department, University of Messina (Italy).

1994 Doctor of Philosophy in Environmental Science - Marine environment and resources (University of Messina, Italy). Title of thesis: "Effects of the trophic and environmental factors on growth performance of Mediterranean mussels (*Mytilus galloprovincialis*, LMK. 1819) cultured in open-sea in the Gulf of Castellammare (South Tyrrhenian Sea)".

1988 Degree in Biological Science (University of Palermo, Italy).

1984 Secondary school diploma (Classical A level)

LANGUAGE SPOKEN

Italian (Native speaker); English (fluent)

COURSE ATTENDED

2000 “Design and analysis of biological experiments: an advanced course”, given by Prof. A.J. Underwood (University of Sidney, AU) and Dr M.G. Chapman (University of Sidney, AU) at the University of Lecce (Italy), 11-15 September 2000.

1999 “Design and analysis of biological experiments”, given by Prof. A.J. Underwood (University of Sidney, AU) and Dr M.G. Chapman (University of Sidney, AU) at the University of Lecce (Italy), 24 May - 4 June 1999;

1994 “PADI Dive Master” [Scuba Diving Assistant], Palermo (Italy)

1989 “Biological Methods for the study of water quality in freshwater environments: the E. B. I method”, given by Prof. P. F. Ghetti (University of Venice, Italy) at University of Trapani (Italy), 01-26 May 1989.

1989 “The role of scuba diving in the environmental monitoring” given by various Instructors at Lega Navale Italiana (Palermo, Italy), July – November 1989;

1989 “The Marine Pollution” Ustica (Italy), September 1989;

PROFESSIONAL APPOINTMENTS AND SYNERGISTIC ACTIVITIES

2014 Session chair at “Respiratory adaptations across thermal clines” in the course of the 3rd International Congress of Respiratory Science, July 06-10 2014 - Bad Honnef (Bonn - Germany)

2014 Visiting scientist, Northeastern University, Boston, USA

2014 Member founder of the new launched: “International Network for the Study of How Organisms Respond to Environmental change” (INSHORE)

2013 Invited speaker at the “Special Seminar Series - Climate change and marine ecosystems” with a seminar entitled: “The bioenergetic mechanistic analysis of organismal functional traits to predict the effects of global climate disturbance on aquatic ecosystems” (Hong Kong, China, 12-19 January 2013)

2012 Member of Scientific Committee of the “Climate Change and Aquaculture: Effects on Biology, Ecology and Productions” Workshop (March 2012, Palermo, Italy)

2012 Italian member of reviewer panel for the of the *Intergovernmental Panel on Climate Change (IPCC) AR5 report 2013*

2012 Invited teacher at the Course (32 hours) on “Bioenergetics and the application of Dynamic Energy Budget models in the current and future casting of effects of climate change on marine organisms” (Hong Kong, China, 16-19 January 2012)

2012 Designed scientific coordinator by University of Palermo for the AXA Research Fund proposal presentations

2012 Designed coordinator by University of Palermo of cultural co-operation framework agreement between University of Palermo and the King Mongkut Institute of Technology Ladkrabang, University of Bangkok, THAILAND

2012 Designed coordinator by University of Palermo of cultural co-operation framework agreement between University of Palermo and the Faculty of Science and Technology University of Kebangsaan, MALAYSIA

2011 Visiting scientist, Univ. South Carolina, Columbia, USA

2011 Visiting scientist, Univ. of Tallin, Estonia

- 2011** Visiting scientist, Univ. of Dublin, Ireland
- 2011** Visiting scientist, Univ. of California Davis, USA
- 2011** Session chair at the Italian Society of Ecology Conference (September 2011, Palermo, Italy)
- 2011** Members of Scientific Committee of the Italian Society of Ecology Conference (September 2011, Palermo, Italy)
- 2011** Invited speaker in Lisboa U. (Portugal)
- 2011** Invited speaker at USC, Columbia (USA)
- 2011** Invited speaker in Aix-en-Provence U. (France)
- 2010** Invited speaker in Nantes U. (France, 2010)
- 2010** Invited speaker in Dublin U. (Ireland)
- 2010** Guest lecturer at AQUADEB International meeting, Nantes, France
- 2009** Head of Scientific Committee of the International workshop entitled: "Marine organisms as proxy of climate change" (March 2009, Palermo, Italy)
- 2008** Visiting Scientist, Univ. of Dubrovnik, Croatia
- 2008** Visiting Scientist, Centre Evidence-Based Conservation@University of Wales, Bangor, UK
- 2007** Visiting Scientist, SWIRE Institute, Univ. of Hong Kong, China
- 2007** Member of Italian Diplomatic Staff, Univ. of Lomonosov Moscow State University, Russia
- 2007** Invited speaker in Moscow (Russia)
- 2007** Invited speaker in Hong Kong (China)
- 2004** Research Grant at Sandgerdi Marine Biological Field Station within BIOCE Project (European Union and University of Reykjavik, Iceland)
- 2001** Research grant (6 months) from the University of Palermo to undertake a period of professional training at the University of Florence, Italy
- 2000** Visiting Scientist Plymouth Marine Biological Laboratory (Dr. John Widdows), Plymouth, UK
- 1998** Organisation Committee of Italian Symposium of Marine Biology (Ustica, Italy)

SYNTHESIS OF SCIENTIFIC APPROACH & MAIN FIELDS OF RESEARCH

"A driver is any natural or human-induced factor that directly or indirectly causes a change in an ecosystem (Millennium Ecosystem Assessment 2005)". The Man's influence on ecosystems is all-pervasive and complex and manifested through dozens of ways, altering structures and ecosystem functioning through its influence on the rates of synthesis of biological structures, chemical compositions, energy and material fluxes, population processes, species interactions and, thereby biodiversity. The most of these ecosystem characteristics relies on general theories; theories make explicit quantitative predictions based on first principles. However current theories make possible to explain most of ecosystem changes due to natural drivers but almost always there is an unpredictable residual variation due to Man's action. Such a residual variation can be measured as "departures from predictions"; the magnitude and direction of these deviations may provide clues to their causes. Then, in the broadest sense, the unifying theme of GSARA's research is how natural drivers and the induced-by-Man's-action residual variation affect ecosystem dynamics and changes, from species to population and community levels. Every

form of human pressure on ecosystems, mostly aquatic, able to induce whichever deviation from natural common patterns calls my attention.

1 – ASSESSING EFFECTS OF CLIMATE CHANGE ON ECO-PHYSIOLOGICAL RESPONSES AND BIOENERGETICS OF MARINE ORGANISMS AND IMPLICATIONS FOR ECOSYSTEM GOOD AND SERVICES. Effect of increasing temperature and acidification in a context of climate change on eco-physiological rates and behavioural traits (*e.g.*, feeding rate, ingestion rate, absorption efficiency, respiration rate, ammonia excretion and heart beat rate) and bioenergetics aspects (DEB models – Dynamic Energy Budget) of marine invertebrates (*e.g.*, bivalves, limpets, winkles) and fish (*e.g.*, *Chromis chromis*, *Sparus aurata*, *Dicentrarchus labrax*, *Aphanius fasciatus*, *Atherina boyeri*) to assess ultimate individual fitness, population dynamics and community structures.

2 – ASSESSING EFFECTS ANTHROPOGENIC ACTIVITIES ON STRUCTURE AND DYNAMICS OF ECOSYSTEMS. Effects of pollution (chemical and physical [noise; temperature, irradiance]) on biological and ecological response of aquatic organisms; recognition of source of organic matter, study of organic matter fluxes and fate and its incorporation into the food webs in polluted systems.

3 – TROPHODYNAMICS OF SHALLOW COASTAL ENVIRONMENTS: LAGOONS, PONDS AND ESTUARIES. Studies on variability induced by anthropogenic pressure on dynamics of shallow waters by means analysis of organic matter (OM) fluxes and role of physical and chemical constraints on distribution of OM and its availability to secondary consumers; assessing food web structure by stable isotopes ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) and recognition of OM sources and fate and rates of incorporation into the food webs in shallow environments.

4 – BIOLOGICAL AND ECOLOGICAL MODELLING, EXPERIMENTAL DESIGN, STATISTICAL ANALYSIS, SYSTEMATIC AND QUANTITATIVE REVIEWING ANALYSIS [META-ANALYSIS]. Modelling of functional niche from functional traits in aquatic organisms through energy budget and biophysical models; application at advanced level of many statistical (parametric and not-parametric) methods; analysis of variance (ANOVA) mixed designs, ANCOVA [test the heterogeneity of slopes and differences between intercepts of regressions] and multivariate methods [Principal component analysis, Correspondence analysis, MDS, Cluster analysis, PERMANOVA, PERDIST). Meta-statistics in reviewing ecological data.

TEACHING EXPERIENCE

Academic Year 2006 to present Teacher of course in 'Ecology' for the Faculty of Science, University of Palermo and Member in Chief of the Board of Examiners.

Academic Year 2004 to present Teacher of course in 'Applied Statistics to Marine Biology' for the Faculty of Marine Biology, Polo Didattico di Trapani, University of Palermo and Member in Chief of the Board of Examiners.

Academic Year 2004 to present Teacher of course in 'Informatics applied to management of aquaculture systems and sustainability' for the Faculty of Marine Biological Resources, University of Palermo Member in Chief of the Board of Examiners.

Academic Year 2004 to present Teacher of course in 'Conservation and management of aquatic biological resources' for the Faculty of Marine Biological Resources, University of Palermo and Member in Chief of the Board of Examiners.

Academic Year 2003 to present Teacher of course in 'Marine Biology' for the Faculty of Marine Biology, Polo Didattico di Trapani, University of Palermo and Member in Chief of the Board of Examiners.

Academic Year 2000 to present Teacher of course in 'Biological Oceanography' for the Faculty of Environmental Sciences, University of Palermo and Member of the Board of Examiners.

From 1995 to 2000 Teacher of several courses of 'Ecology' and associate topics for the Faculty of Environmental Sciences, University of Palermo and Member of the Board of Examiners.

DOCTORAL SUPERVISOR AND TUTORING

From 1990 to 2000 co-tutor of 22 Master Degree's and 2 Ph. D. Thesis

From 2004 to date, Advisor and Tutor of further 98 Undergraduate and Graduate Degree's and 10 Ph. D. students and 4 post-docs

MAJOR AFFILIATIONS

- ✓ The Italian Marine Biology Society (SIBM, 1989)
- ✓ American Society of Limnology and Oceanography (ASLO, 1992)
- ✓ Coastal Education Research Foundation (CERF, 1994)
- ✓ Estuarine Research Federation (ERF, 1995)
- ✓ Italian Society of Marine Science (Conisma, 1995)
- ✓ National Shellfish Association (NSA, 1998).

REVIEWER ACTIVITY

- Editorial Board of:

Aquaculture Environment Interactions (AEI) (<http://www.int-res.com/journals/aei/aei-home/>)

AIOL - Advances in Oceanography and Limnology (<http://www.tandf.co.uk/journals/journal.asp?issn=1947-5721&linktype=5>)

- Referee of International Journals: *Aquaculture*; *Aquaculture International*; *Aquaculture Engineering*; *Ecological Modelling*; *Marine Biology*; *Chemistry and Ecology*; *Marine Environmental Research*; *Marine Ecology Progress Series*; *Journal of the Marine Biological Association of the United Kingdom*, *Journal of Environment, Development and Sustainability*, *Oecologia*.
- Italian Journals of ecology, zoology and marine ecology

COLLABORATORS AND CO-EDITORS

G. Williams (Hong Kong U, China)
B. Glamuzina (Dubrovnik U, Croatia)
J. M. Dean (South Carolina U, USA)
J. Murray (South Carolina U, USA)
M. Peharda (Oceanography and Fisheries, Split Croatia)
B. Helmuth (South Carolina U, USA)
A. Haldorsson (Sandgerdi Marine Centre, Sandgerdi, Iceland)
A. Modica (ENI – Italian Energy Center, Italy)
A. Pusceddu (Ancona U, Italy)
G. Ceccherelli (Sassari U, Italy)
J. Widdows (NERC, Marine Biological Lab., Plymouth, UK)
M. De Pirro (Regional Aquarium of Santo Stefano dell'Argentario, GR, Italy)
S. Corsolini (Siena U, Italy)
M. Kearney (Melbourne U, Australia)
Y. Dong (Xiamen U, China)
E. Carrington (Washington U, USA)
M. Troell (Royal Swedish Ac. Science, Sweden)
G. Reid (Fisheries and Oceans, Canada)
S.A.L.M. Kooijman (Vrije U, The Netherlands).

A SELECTION OF LAST 3-YEARS PUBLICATIONS -> TO DATE (FOR THE WHOLE LIST OF PUBLICATIONS AND DOWNLOADING, GO TO: http://www.unipa.it/gsaralab/publicazioni_en.html)

Author of 277 scientific articles including **87 ISI with IF**, 1 Ph.D. dissertation, 2 book (in Italian), 2 book chapters and over 31 program research reports.

2014 Montalto, V., Sarà, G., Ruti, P., Dell'Aquila, A. and Helmuth, B. *in press*. Testing the effects of temporal data resolution on predictions of bivalve fitness in the context of global warming. *Ecological Modelling*.

2014 Matzelle, A., Montalto, V., Sarà, G., Zippay, M. and Helmuth, B. *in press* 2014. Application of the covariation method for Dynamic Energy Budget model parameterization of the bivalve *Mytilus californianus*. *Journal of Sea Research*.

2014 Sarà, G., Rinaldi, A., Montalto, V. *in press*. Thinking beyond organism energy use: a trait based bioenergetic mechanistic approach for predictions of life history traits in marine organisms. *Marine Ecology*.

2014 Gianguzza, P., Visconti, G., Gianguzza, F., Vizzini, S., Sarà, G., Dupont, S. *in press*. Temperature modulates the response of the thermophile sea urchin *Arbacia lixula* early life stages to CO₂-driven acidification. *Marine Environmental Research*.

2014 Sarà, G., Milanese, M., Prusina, I., Sarà, A., Angel, D.L., Glamuzina, B., Nitzan, T., Freeman, S., Rinaldi, A., Palmeri, V., Montalto, V., Lo Martire, M., Gianguzza, P., Arizza, V., Lo Brutto S., De Pirro, M., Helmuth, B., Murray, J., De Cantis, S. and Williams, G.A. 2014. The impact of climate change on Mediterranean intertidal communities: losses in coastal ecosystem integrity and services. *Regional Environmental Change* 14: 5–17

- 2013 Sarà, G.** Palmeri, V., Rinaldi, A., Montalto, V. and Helmuth, B. 2013 Predicting biological invasions in marine habitats through eco-physiological mechanistic models: a study case with the bivalve *Brachidontes pharaonis*. *Diversity and Distribution* 19: 1235-1247.
- 2013 Sarà, G.**, Palmeri, V., Montalto, V., Rinaldi, A. and Widdows J. 2013 The parameterisation of bivalve functional traits in a context of mechanistic ecophysiological Dynamic Energy Budget model. *Marine Ecology Progress Series* (DOI: 10.3354/meps10195).
- 2013 Burnett, N. P.**, Seabra, R., de Pirro, M., Zippay, M. L., Monaco, C., Woodin, S., Helmuth, B., Sarà, G., Wetthey, D. S., Lima, F. P. An improved non-invasive method for measuring heartbeat of intertidal animals. *Limnology and Oceanography Methods*.
- 2012 Sarà, G.**, Reid, G., Rinaldi, A., Palmeri, V., Troell, M. and Kooijman S.A.L.M. 2012. Growth and reproductive simulation of candidate shellfish species at fish cages in the southern Mediterranean: Dynamic Energy Budget (DEB) modelling for integrated multi-trophic aquaculture. *Aquaculture* 324-325: 259-266.
- 2012 Bracciali, C.**, Campobello, D., Giacomini, C. and Sarà, G. 2012. Effects of nautical traffic and noise on foraging patterns of Mediterranean damselfish (*Chromis chromis*). *Plos One* 7(7): e40582. www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0040582
- 2011 Sarà, G.**, Kearney, M. and Helmuth, B. 2011. Combining heat-transfer and energy budget models to predict local and geographic patterns of mortality in Mediterranean intertidal mussels. *Chemistry and Ecology* 27: 135-145.

RESEARCH PROJECTS (FROM 2004- TO DATE)

- 2013-2015** Minister of University of Italian Government - "Research Programmes of National Interest (PRIN)" [Leader of Local Research Unit]: - Observing, Modelling And Testing Synergies And Trade-Offs For The Adaptive Management Of Multiple Impacts In Coastal Systems (TETRIS)". Joint Project with many Italian Universities.
- 2011** Environmental Minister of Italian Government [Project Leader]: "The intertidal system of Effect of recreational nautical noise on marine communities and behaviour of fish in a Marine Protected Area (Capo Gallo and Isole delle Femmine, Northern Sicily)".
- 2009-2011** Italian Research Projects in Antarctica (PNRA) [Leader of Local Research Unit]: "Flows of POPs between polar abiotic and biotic compartments (POP-LAB)". Joint Project with University of Siena and Florence (Italy).
- 2010** Sicilian Local Government [Project Leader]. "Scientific divulgation and public concern in Sicily. 3".
- 2008-2010** Climate Impact Research Coordination for a Larger Europe (CIRCLE), [Principal Investigator]: "The impact of climate change on Mediterranean intertidal communities: losses in coastal ecosystem integrity and services – INTER-MED", Joint Research Project with University of Haifa (Dr. D. Angel; IS) and University of Dubrovnik (Prof. B. Glamuzina; CR).
- 2008-2009** Italian Minister of Agriculture and Fisheries (MIPAF), [Leader of Local Research Unit]: "Effects of organic pollutants on marine pelagic food webs: tuna and swordfish".
- 2008** Italian Research Council (CNR) and DAIMAR company, [Project Leader]: "Effect of noise on behaviour of coastal organisms".
- 2008** Sicilian Local Government – POR Misura 4.17, [Project Leader]: "Scientific divulgation and public concern in Sicily. 2".

2007-2008 Environmental Minister of Italian Government, [Project Leader]: "Effect of recreational nautical noise on marine communities and behaviour of fish in a Marine Protected Area (Capo Gallo and Isole delle Femmine, Northern Sicily)".

2007-2008 ENI-ICRAM, [Leader of Local Research Unit]: "FAD effect of platforms on the surroundings: structure and dynamics of associated communities and effect on the behaviours".

2007 Sicilian Local Government [Project Leader]: "Scientific divulgation of culture of the Sea and public concern in Sicily".

2006-2007 Sicilian Local Government, POR, [Project Leader]: "An integrated model of coastal management using sustainable aquaculture for reducing the impact of mariculture".

2007 URS-ENI [Leader of Research Unit]: "Analysis of pipeline impact on soft bottom benthic invertebrates in the Gela marine area (Southern Sicily)".

2007 World Wildlife Fund (WWF Italy) and Sicilian Local Government: "Analysis and distribution *Procambarus clarkii* inside a Regional Reserve (Preola and Gorgi Tondi Lakes, Western Sicily)".

2004 BIOCE Project, European Union and University of Reykjavik (Iceland), [Leader of Research Unit]: "Food web analysis and biomagnification in Sandgerdi shores (Iceland) using multiple stable isotopes".

REFERENCES

- ✓ Prof. Gray Williams, (University of Hong Kong, CHINA; email: hrsbwga@hku.hk)
- ✓ Prof. Brian Helmuth (Northeastern University, Marine Science Center, Boston, MA, USA; email: b.helmuth@neu.edu)
- ✓ Prof. John Widdows (Plymouth Marine Laboratory, Plymouth, UK; email: johnwiddows@btinternet.com)

Palermo, Italy 09/02/2014

Gianluca Sarà

