



3rd MARINE ZOOLOGY

INTERNATIONAL SUMMER SCHOOL

An integrated approach to marine invertebrate biodiversity: evolutionary and functional adaptations

Location: [Avamposto MARE](#)

Tricase porto (Lecce), Italy

21-26 September 2015

Scope

Invertebrates represent the largest component of biodiversity and the widest evolutionary adaptive radiation on our planet, with more than 2,000,000 morpho-species formally described (95% of the overall animal biodiversity). They include aquatic organisms with relatively simple body plans such as sponges or cnidarians as well as morphologically complex taxa, such as molluscs, echinoderms and protochordates. Among them, several taxa have been established or are currently emerging as laboratory model systems, simple versions of more complex organisms. By investigating life cycles and functional adaptations of marine invertebrates, scientists learn on the evolution of Metazoa.

Research on marine invertebrates led to some of the greatest scientific advances. Studies on squid biology led to the comprehension of the molecular basis of synaptic transmission; investigations on sea urchin were fundamental toward the understanding of sexual reproduction and early development; polychaetes provided key information on the evolution and development of centralized nervous systems; cnidarians offered fundamental insights on aging, stem cell biology and the molecular mechanisms controlling cell differentiation; sponges, placozoans and ctenophora are groups for tracing back the evolution of multicellularity. Furthermore, marine invertebrates are considered a largely untapped source of bioactive compounds.

In-depth knowledge of adaptive strategies of marine invertebrates is mandatory for the comprehension of the organism-environment interactions, the intra-specific and inter-specific relationships, the functioning of biological communities and ecosystems, and the management of resources in conservation programs. The third edition of the Marine Zoology summer school is organized in the framework of a joint agreement of academic cooperation between the Universities of Milan, Padoa, Palermo, and Salento (Lecce). The



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scientific themes will cover comparative analysis of main adaptive strategies across several invertebrate phyla to raise interest on invertebrate biology and evolution.

Finally, this international school will provide the opportunity for exchanges between students of different European universities and can be credited as a Master Course Program, acknowledged by 4 ECTS (CFU) through a specific final verification test.

Course structure

It will be taught in English and will consist of lectures, field and laboratory activities and tutorials addressing morphology, anatomy, ecology, developmental biology (including eco-devo and evo-devo approaches) of selected marine invertebrate groups in the general framework of their reciprocal evolutionary relationships, with focus on their adaptive strategies to various environments, life cycle adjustments, environmental stress responses, and immunobiology.

Active participation will be essential as students will make observations on living invertebrates, carry on experimental bench work, analyse results, and discuss recent bibliography. In addition, communication skills will be developed, including informal interactions with instructors, collaborative work with other participants, oral presentation of their interests, written report describing the experiments and analysing their own results.

•Fieldwork: The seaside location (directly on the the Strait of Otranto) of the new marine laboratory Avamposto MARE and the availability of the UNISALENTO research boat "Pelagia" will offer the opportunity for invertebrate sampling by plankton tows, snorkeling, diving (only patented divers).

•Practical work: Students will work on microscopes and dissecting microscopes throughout the course to carry on direct observations of features presented by lecturers.

Contents (Main taxa, Topics, Models)

- Cnidaria (Anthozoa, Medusozoa), Cyclophora, Annelida, Mollusca, Xenacoelomorpha, Echinodermata, Pterobranchia, Tunicata
- Morphological and functional adaptations (sensory-motor integration, respiration, nutrition, locomotion and reproduction), life cycles and life histories,
- Regeneration, aging, reverse development, population outbreaks.
- Stress responses and Immunobiology
- *Actinia equina*, *Anemonia viridis*, *Turritopsis dohrni*, *Clava multicornis*, *Clytia hemisphaerica*, *Pelagia noctiluca*, *Cotylorhiza tuberculata*, *Aurelia* spp., *Symbion* spp., *Platynereis dumerilii*, *Symsagittifera roscoffensis*, *Anthedon* sp., *Paracentrotus lividus*,



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Arbacia lixula, *Rhabdopleura* sp., *Botryllus* sp., *Ciona intestinalis*, *Phallusia mammillata*, and many more.

Contributors and lecturers

Xavier Bailly
Station Biologique de Roscoff, France
E-mail: xavier.bailly@sb-roscoff.fr

Loriano Ballarin
Department of Biology, University of Padova, Padova, Italy.
E-mail: loriano.ballarin@unipd.it

Ferdinando Boero
Department of Biological and Environmental Science and Technology (DISTEBA), Salento University, Lecce, Italy
E-mail: boero@unisalento.it

Matteo Cammarata
Department of Biological, Chemical and Pharmaceutical Science and Technology, University of Palermo, Palermo, Italy.
E-mail: matteo.cammarata@unipa.it

Maria Daniela Candia Carnevali
Department of Biosciences, University of Milano, Milano, Italy
E-mail: daniela.candia@unimi.it

Nicola Franchi
Department of Biological, Chemical and Pharmaceutical Science and Technology, University of Palermo, Palermo and Department of Biology, University of Padova, Padova, Italy.
Email: nicola.franchi@unipd.it

Adriana Giangrande
Department of Biological and Environmental Science and Technology (DISTEBA), Salento University, Lecce, Italy
E-mail: adriana.giangrande@unisalento.it

Antonella Leone
CNR, National Research Council, Institute of Sciences of Food Production, ISPA-CNR, Lecce, Italy
E-mail: antonella.leone@ispa.cnr.it

Ricardo Neves
University of Basel, Biozentrum, Switzerland
E-mail: ricardon.6@gmail.com

Maria Giovanna Parisi
Dept. of Biological, Chemical and Pharmaceutical Science and Technology, University of Palermo, Italy.
E-mail: mariagiovanna.parisi@unipa.it

Roberta Pennati
Department of Biosciences, University of Milano, Milano, Italy
E-mail: roberta.pennati@unimi.it

Stefano Piraino
Department of Biological and Environmental Science and Technology (DISTEBA), Salento University, Lecce, Italy
E-mail: stefano.piraino@unisalento.it

Michela Sugni
Department of Biosciences, University of Milano, Milano, Italy
E-mail: michela.sugni@unimi.it

Antonio Terlizzi
Department of Biological and Environmental Science and Technology (DISTEBA), Salento University, Lecce, Italy
E-mail: antonio.terlizzi@unisalento.it

Stefano Tiozzo
Station Zoologique, Villefranche-sur-mer, France



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E-mail: tiozzo@obs-vlfr.fr

Jacopo Vizioli
Laboratoire de Spectrométrie de Masse Biologique Fondamentale et Appliquée (FABMS), Université Lille 1, Lille, France
E-mail: jacopo.vizioli@univ-lille1.fr

Registration and deadline for application

A registration fee of 150€ (one hundred fifty euro) will contribute to fully cover course fee and full board accommodation (six nights + meals from Monday to Friday) in 3-star level B&B venues (single/double room with private bathroom). Students enrolled to Master and PhD Courses in Marine Sciences are encouraged to apply. A minimum English proficiency equivalent to B2 level is required although proficiency certification is not mandatory (it may be replaced by direct skype interviews before final admission). Knowledge of fundamentals of zoology, molecular, cell and developmental biology is essential.

A maximum number of 20 persons will be selected.

Send applications as single pdf file to

Stefano Piraino (stefano.piraino@unisalento.it) by **September 06th**

Applications should include full department address, phone, e-mail, skype address, together with a short curriculum vitae, description of the applicant's current research interest, and a letter of presentation written by a tutor from applicant's home institution.

All eligible candidates will be notified for acceptance by e-mail on first-come, first-choice base.

Venue

Avamposto Mare is a new marine laboratory jointly established by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), the Municipality of Tricase (Lecce), and the University of Salento (Lecce) at [Tricase Porto \(map\)](#)

HOW TO REACH LECCE

The nearest airport is BRINDISI CASALE airport, connected by regular flights by ALITALIA with the two main national hubs of Milano and Rome and with direct connection to several European cities by low cost companies (RYAN AIR, EASY JET, TUI, VOLOTEA, HELVETIC, JETAIRFLY).



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Time planning of shuttle buses connecting Brindisi airport to Lecce (€ 8.00 tickets can be purchased on board) can be found at [BUS AIRPORT - LECCE - AIRPORT](http://www.eliostours.it/ita/pagina.asp?id=136) (<http://www.eliostours.it/ita/pagina.asp?id=136>)

Airport shared shuttle taxi transportation to Lecce (€ 20 per person) can be booked at [SHUTTLE TAXI AIRPORT - LECCE](http://www.airshuttle.it/index_eng.asp) (http://www.airshuttle.it/index_eng.asp)

HOW TO REACH TRICASE PORTO

Several shuttle minibus transportation from Lecce to Tricase (40 min drive) will be organized starting at 11 a.m., on Sunday 20th. Participants will need to provide their travel schedule to/from Lecce to the course organization not later than September 10th.

Further info:

stefano.piraino@unisalento.it

083229861 - 347 5368380

Looking forward to seeing you in Tricase Porto

The Organizers

Loriano Ballarin
Dipartimento di Biologia, Università di Padova, via Ugo Bassi 58/B, 35131 Padova
loriano.ballarin@unipd.it

Maria Daniela Candia Carnevali
Dipartimento di Bioscienze, Università di Milano, Via Celoria 26, Milano
daniela.candia@unimi.it

Matteo Cammarata
Dipartimento di Biologia Ambientale e Biodiversità, Università di Palermo, via Archirafi 18, 90123 Palermo
matteo.cammarata@unipa.it

Stefano Piraino
Dipartimento di Scienze e Tecnologie Biologiche ed Ambientali,



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Università del Salento, 73100 Lecce, Italy
stefano.piraino@unisalento.it



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