Curriculum Vitae et studiorum of Massimiliano FENICE

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Massimiliano Fenice, born December 22, 1959, graduated in Biological Sciences in 1983 (Master) at the University of Genova, Italy, acquired domestic experience as a research assistant in the "Laboratorio di Oncologia Pediatrica" of the Gaslini Institute, Genova, Italy; as head of the Biotechnology Department at Applikon Italia, Genova; and as researcher (plant cell cultures) at the Agroplantec (ERG Group), Genova.

In 1992 He entered the academic career as Assistant Professor (lecturer) at the University of Tuscia (Viterbo, Italy).

At the present, M. Fenice is Full Professor of Microbiology at DEB. He directed many bachelor and Master diploma works and PhD thesis.

He is head of the Microbiology Laboratory of DEB and the Laboratory of Marine Applied Microbiology of CoNISMa (Consorzio Nazionale Interuniversitario Scienze del Mare), University of Tuscia.

He was and is involved in the University of Tuscia management being member or chairperson of various administrative bodies. He was responsible for international relationships and "Erasmus" at DEB.

He is currently Responsible of the Bachelor degree in "Environmental Biology", the Master Degree in "Marine Ecology and Biology" and the Double Master Diploma in "Marine Environment and Biology" established with the People's Friendship University of Russia (RUDN) of Moscow (Russia).

He is member of the Teaching Staff of the PhD school in "Ecology and sustainable management of environmental resources"; he participated in various International and National commissions for the final examination and attribution of the PhD title.

He is member of the following International Scientific Societies: MSA, Mycological Society of America, EUCHIS, European Chitin and Chitosan Society (member of the society Board), BENA, Balkan Environmental Association (Chairman of the Mediterranean Liason Office), and SIMGBM: Società Italiana di Microbiologia Generale e Biotecnologie Microbiche (Italian Society of General Microbiology and Microbial Biotechnology).

He is Vice-Director of the Italian-Russian Institute of Ecology (Istituto Italo-Russo di Formazione e Ricerche in Ecologia, IIRFRE).

He is/was responsible of various national and international scientific projects (see below).

M. Fenice major fields of interest:

- Microbial production of biomass, enzymes or other by-products
- Immobilization of microbial cells for the production of enzymes, or organic acids and for the degradation of pollutants
- Bioreactor design and optimization of microbial bio-processes (fermentations)
- Biotechnological treatments and reuse of water/wastewater
- Microbial Bio-diversity of marine and/or extreme environments.
- Production of Bio-methane and Bio-hydrogen (in collaboration with ENEA)

Main Scientific collaborations.

1. Prof. J. Gonzalez Lopez Instituto del Agua/Farmacy Faculty, Un. of Granada, Granada, ES. The collaboration started in 1999 within the EC project "Medusa water", dealing with the biological treatment of Olive Mill Wastewater. During these years, other common projects were developed to enforce the collaboration that was also implemented through scientist interchange. In 2006 the two groups were financed for a project concerning the "Biodegradation of phenolic and/or recalcitrant compounds from industrial and Agro-industrial effluents by marine bacteria". In 2009, the two groups obtained an EC grant (Project "Algatec") dealing with the recovery of olive washing water by biological treatments in photobioreactor.

2. Dr. J. Cardoso Duarte, Ineti, Lisbon, PT. The collaboration with this research group started in 1999 With the EC project "Medusa Water" and lead to the formation of a scientist network in the field of agricultural wastes and wastewater treatment and reuse.

3. Prof. G.W. Gooday ✞, Prof. N. A. Gow, Prof. P. Van West: Dep. of Molecular and cell biology, University of Aberdeen, U.K.
   Within this collaboration, including a bilateral project financed by the Italian Government and the British Council, various studies on chitinolytic fungi were carried out. In addition, various scientist interchange occurred including a 5 month stay of Dr. Fenice at the University of Aberdeen laboratories.

4. D. E. Raetz, Dr. JL. Leuba✞: Nestlè Research Center (Nestec), Lausanne, CH. Within this collaboration, various studies on application of chitinases were carried out. In addition, scientist interchange occurred including a 5 month stay of Dr. Fenice in the Nestec Laboratories financed by a Nestle grant. Publications and a patent arose from this scientific collaboration in the period 1998-1999.

5. Prof. N. Vassilev: University of Granada, Granada, ES. Collaboration with Dr. Vassilev in 1996 when he was in the "Estacion experimental del Zaidin, CSIC, Granada" by a grant of the Italian Research Council (CNR). Various publications arouse from this scientific collaboration in the years 1996-2004.

6. Prof. M. Angelova: The Bulgarian Academy of Science, S. Angeloff Institute of Microbiology, Sofia, Bulgaria.

He has/had also other collaborations (scientific and/or didactic) with other European Universities: University: Prof. Fazilet Vardar-Sucan, EGE University, Izmir, Turkey. Prof. Alexander Tzetlin, University of Moscow "Lomonosov", Russia. Prof. Evgeny Martinenko, RUDN University, Moscow, Russia.

M. Fenice published more than 85 papers mainly on international Journals with I.F. His participation to international conferences is documented by more than 65 posters, oral communications or extended abstracts. He also published a patent and some book chapters.

He is Associate Editor of some journals (i.e. Annals of Microbiology, Molecules, Journal of environmental protection and ecology), and reviewer for many journals dealing with general, environmental and applied microbiology.

Recent publications (2013-2022).

1. SILVI S., BARGHINI P., AQUILANTI A., JURAEZ-JIMENEZ B., and FENICE M. 2013. Physiologic and metabolic characterization of a new marine isolate (BM39) of *Pantoea* sp. producing high levels of exopolysaccharide. Microb Cell Fac 12:10. DOI: 10.1186/1475-2859-12-10
2. REBOLEIRO RIVAS P., JUAREZ JIMENEZ B. MARTINEZ TOLEDO M.V., RODELAS M., ANDRADE L., GONZALEZ LOPEZ J. and FENICE M. 2013. Bacterial communities' structure in a high mountain lake during the ice-free season: cultural and PCR-TGGE investigations. Int J Environ Res. 7: 685-696
3. ISOLA D., SELBMANN L., DE HOOG GS., FENICE M., ONOFRI S., PRENAFETA-BOLDUC FX., ZUCCONI L. 2013. Isolation and screening of black fungi as potential degraders of volatile aromatic hydrocarbons. MYCOPATHOLOGIA, 175, pp. 369-379. ISSN: 0301-486X. DOI: 10.1007/s11046-013-9635-2
4. MAZA-MARQUEZ P., MARTINEZ-TOLEDO MV., GONZALEZ LOPEZ J., RODELAS B., JUAREZ-JIMENEZ B., and FENICE M. 2013. Biodegradation of olive washing wastewater pollutants by highly efficient phenol-degrading strains selected from adapted bacterial community. Int Biodeter Biodegr. 82: 192-198 doi: 10.1016/j.ibiod.2013.03.025.
5. BARGHINI P., MOSCATELLI D., GARZILLO A.M.V., CROGNALE S. and FENICE M. 2013. High production of cold-tolerant chitinases on shrimp wastes in bench-top bioreactor by the Antarctic fungus *Lecanicillium muscarium* CCFEE 5003: bioprocess optimization and characterization of two main enzymes. Enzyme Microb Technol. 53: 331-338. 10.1016/j.enzmictec.2013.07.005
6. MAZA-MARQUEZ P., MARIA VICTORIA MARTINEZ-TOLEDO MV., FENICE M., ANDRADE L., LASSERROT A. AND JESUS GONZALEZ-LOPEZ J. 2014. Biotreatment of olive washing wastewater by a selected microalgal-bacterial consortium. Int Biodeter Biodeg. 88: 69-76, ISSN: 0964-8305
7. ANDRADE L., GONZALEZ-LOPEZ J., FENICE M, MARTINEZ-TOLEDO M.V., PESCIAROLI C., MAZA-MARQUEZ P., JUAREZ-JIMENEZ B. 2014 Application of response surface methodology (RSM) for culture conditions and biomass pro-duction of psychrophilic microalgae isolated from high mountain lake during the ice-free season. Int J Environ Res. 8: 799-812.ISSN: 1735-6865
8. GORRASI S., IZZO G., MASSINI G., SIGNORINI A., BARGHINI P., FENICE M. 2014. From polluting seafood wastes to energy: production of hydrogen and methane from raw chitin material by a two-phases process. J environ prot ecol. 15: 526-536, ISSN: 1311-5065.
9. BARGHINI P, SILVI S, AQUILANTI A, MARCELLI M. and FENICE M. 2014. Bacteria from marine salterns as a model of microorganisms adapted to high environmental variations J environ prot ecol. 15: 897-906, ISSN: 1311-5065, doi
10. PESCIAROLI C., RODELAS B., JUAREZ-JIMÉNEZ B., BARGHINI P. and FENICE M. 2015. Bacterial community structure of a coastal area in Kandalaksha Bay, White Sea, Russia: possible relation to tidal hydrodynamics. Ann. Microbiol. 65: 443-453.
11. PESCIAROLI C., BARGHINI P., CERFOLLI F., BELLISARIO B., and FENICE M. 2015. Relationship between phylogenetic and nutritional diversity in Arctic (Kandalaksha Bay) seawater planktonic bacteria Ann. Microbiol. 65: 2405-2414. DOI 10.1007/s13213-015-1083-4
12. PASQUALETTI M., TEMPESTA S., MALAVASI V.2, BARGHINI P. and FENICE M. 2015 Lutein production by *Coccomyxa* sp. SCCA048 isolated from a heavy metal-polluted river in Sardinia (Italy). J environ prot ecol. 16: 1262-1272
13. ZUCCONI L., ONOFRI S., CECCHINI C., ISOLA D., RIPA C., FENICE M., MADONNA S., REBOLEIRO-RIVAS P. and SELBMANN L. 2016. Mapping the lithic colonization at the boundaries of life in Northern Victoria Land, Antarctica. Polar Biol. 39: 91-102 (Published on line in 2014). DOI 10.1007/s00300-014-1624-5
14. FENICE M. 2016. The psychrotolerant Antarctic fungus *Lecanicillium muscarium* CCFEE 5003: a powerful producer of cold-tolerant chitinolytic enzymes. MOLECULES, vol. 21, ISSN: 1420-3049, doi: 10.3390/molecules21040447
15. MAZA-MÁRQUEZ P., GONZÁLEZ-MARTÍNEZ A., MARTÍNEZ-TOLEDO MV., FENICE M., LASSERROT A., GONZÁLEZ-LÓPEZ J. 2017. Biotreatment of industrial olive washing water by synergetic association of microalgal-bacterial consortia in a photobioreactor. Environ Sci Pollut Res. **527-538** DOI: 10.1007/s11356-016-7753-3
16. TIMPERIO A.M., GORRASI S., ZOLLA L. AND FENICE M. 2017. Evaluation of MALDI-TOF mass spectrometry and MALDI BioTyper in comparison to 16S rDNA sequencing for the identification of bacteria isolated from Arctic sea water. Plos-One. 12, 7. Article number e0181860. DOI: 10.1371/journal.pone.0181860

17. LEYVA-DÍAZ J.C., POYATOS J.M., BARGHINI P., GORRASI S. and FENICE M. 2017. Kinetic modeling of Shewanella baltica KB30 growth on different substrates through respirometry. Microb Cell Fac 16:189. DOI: 10.1186/s12934-017-0805-7.
18. BARGHINI P., GIOVANNINI V., FENICE M., GORRASI S., AND PASQUALETTI M. **2018**. High lutein production by a halo-tolerant strain of *Dunaliella* sp. (Chlorophyceae) isolated from solar salterns in Central Italy. J environ prot ecol. 19(2): 704–712
19. BARGHINI, P., PASQUALETTI, M., GORRASI, S., and FENICE, M. **2018**. Bacteria from the "Saline di Tarquinia" marine salterns revealing very atypical growth profiles in relation to salinity and temperature Mediterr. Mar. Sci, 19 (3) 513-525. doi:http://dx.doi.org/10.12681/mms.15514,
20. PASQUALETTI M., BARGHINI P., GIOVANNINI V., AND FENICE M. **2019**. High production of chitinolytic activity in halophilic conditions by a new marine strain of Clonostachys rosea. Molecules. 24(10), 1880 10.3390/molecules24101880
21. GORRASI, S., PESCIAROLI, C., BARGHINI, P., PASQUALETTI, M. AND FENICE M. **2019**. Structure and diversity of the bacterial community of Kandalaksha Bay (White Sea, Russia), a complex Arctic estuarine system submitted to intense tidal currents. J. Mar. Syst. 196: 77-85.
22. GIOVANNINI, V., BARGHINI, P., GORRASI, S., FENICE, M. AND PASQUALETTI, M., 2019. Marine fungi: a potential source of novel enzymes for environmental and biotechnological applications. J environ prot ecol. 20(3) 1214-1222
23. MARTIN-PASCUAL. J., LOPEZ-LOPEZ, C., FENICE, M., CALERO-DÍAZ, G., TORRES, JC., AND POYATOS, J.M., **2019**. Effect of the biomass and operating on the biodegradation capacity of a mix of pharmaceuticals (carbamazepine, ibuprofen and ciprofloxacin) in a membrane bioreactor. J. Environ. Eng. **IN PRESS**
24. PASQUALETTI, M., GIOVANNINI, V., BARGHINI, P., GORRASI, S., AND FENICE M. 2020. Diversity and ecology of culturable marine fungi associated with *Posidonia oceanica* leaves and their epiphytic algae *Dictyota dichotoma* and *Sphaerococcus coronopifolius*. Fungal Ecology 40, **Published on line**.
25. MARTIN-PASCUAL. J., LOPEZ-LOPEZ, C., FENICE, M., CALERO-DÍAZ, G., TORRES, JC., AND POYATOS, J.M., **2020**. Effect of the biomass and operating on the biodegradation capacity of a mix of pharmaceuticals (carbamazepine, ibuprofen and ciprofloxacin) in a membrane bioreactor. J. Environ. Eng. 146(6): 04020047. DOI: 10.1061/(ASCE)EE.1943-7870.0001726.
26. PASQUALETTI, M., GIOVANNINI, V., BARGHINI, P., GORRASI, S., AND FENICE M. 2020. Diversity and ecology of culturable marine fungi associated with *Posidonia oceanica* leaves and their epiphytic algae *Dictyota dichotoma* and *Sphaerococcus coronopifolius*. Fungal Ecology *44*, 100906, Published on line.
27. GORRASI, S., PASQUALETTI, M., FRANZETTI, F., PITTINO, F., AND FENICE, M. (2020). *Vibrio* communities along a salinity gradient within a marine salterns hypersaline environment (Saline di Tarquinia, Italy). Environ Microbiol**, 22** (10). 4356-4366 doi: 10.1111/1462-2920.15041
28. LEYVA-DIAZ J.C., MUNIO M.M, FENICE, M., AND POYATOS, J.M., (2020) Respirometric method for kinetic modeling of ammonium-oxidizing and nitrite-oxidizing bacteria in a membrane bioreactor. AIChE Journal. 66e16271, doi: 10.1002/aic.16271
29. BOTTA, L., SALADINO, R., BARGHINI, P., FENICE, M., AND PASQUALETTI, M., 2020. Production and identification of two antifungal terpenoids from the Posidonia oceanica epiphytic Ascomycota Mariannaea humicola IG100. Microb Cell Fac 19:184. Doi: 10.1186/s12934-020-01445-7.
30. LEMBO, G., ROSA, S., MAZZURCO MIRITANA, V., MARONE, A., MASSINI, G., FENICE, M., SIGNORINI, A., 2021. Thermophilic anaerobic digestion of second cheese whey: microbial community response to H_2 addition in a partially immobilized anaerobic reactor. Processes 2021, **9**, 43. Doi:10.3390/pr9010043.
31. GORRASI, S., FRANZETTI, A., AMBROSINI, R., PITTINO, R., PASQUALETTI, M., AND FENICE, M. 2021. Spatio-Temporal Variation of the Bacterial Communities along a Salinity Gradient within a Thalassohaline Environment (Saline di Tarquinia Salterns, Italy). Molecules. 26(5), 1338. Doi: 10.3390/molecules26051338.
32. GORRASI, S., PASQUALETTI, M., FRANZETTI, A., GONZALEZ-MARTINEZ, A., GONZALEZ-LOPEZ, J., MUÑOZ-PALAZON, B., AND FENICE, M. 2021. Persistence of *Enterobacteriaceae* Drawn into a Marine Saltern (Saline di Tarquinia, Italy) from the Adjacent Coastal Zone. *Water*. 13(11):1443. Doi: 10.3390/w13111443.
33. PASQUALETTI, M., GORRASI, S., GIOVANNINI, V., BRACONCINI, M., AND FENICE M. 2022. Polyextremophilic chitinolytic activity by a marine strain (IG119) of *Clonostachys rosea.* Molecules. 27 (3) 688. Doi: 10.3390/molecules2703668.
34. GORRASI, S., PASQUALETTI, M., BRACONCINI, M., MUÑOZ-PALAZON, B., AND FENICE, M. 2022. Could Pontimonas Harbour Halophilic Members Able to Withstand Very Broad Salinity Variations? *Microorganisms*, *10*(4), 790. DOI: 10.3390/microorganisms10040790.
35. GORRASI, S., PASQUALETTI, M., MUÑOZ-PALAZON B., NOVELLO, G., MAZZUCATO, A., CAMPIGLIA, E., AND FENICE, M. (2022). Comparison of the Peel-Associated Epiphytic Bacteria of Anthocyanin-Rich "Sun Black" and Wild-Type Tomatoes under Organic and Conventional Farming. *Microorganisms*, 10(11), 2240, ISSN: 2076-2607, doi: 10.3390/microorganisms10112240

36. MUÑOZ-PALAZON B., GORRASI, S., ROSA-MASEGOSA A., PASQUALETTI, M., BRACONCINI, M., AND FENICE, M. (2022). Treatment of High-Polyphenol-Content Waters Using Biotechnological Approaches: The Latest Update. *Molecules*, 28(1), 314. Doi: 10.3390/molecules28010314
37. ROSA-MASEGOSA, AURORA, MUÑOZ-PALAZON, BARBARA, GORRASI, SUSANNA, FENICE, MASSIMILIANO, GONZALEZ-MARTINEZ, ALEJANDRO, GONZALEZ-LOPEZ, JESUS (2023). Description of new single-chamber continuous-flow reactors of aerobic granular sludge: Technical and biological study. JOURNAL OF ENVIRONMENTAL CHEMICAL ENGINEERING, vol. 11, ISSN: 2213-3437, doi: 10.1016/j.jece.2023.109938
38. JUÁREZ-JIMÉNEZ, BELÉN, FENICE, MASSIMILIANO, PASQUALETTI, MARCELLA, MUÑOZ-PALAZON, BARBARA, CORREA-GALEOTE, DAVID, BRACONCINI, MARTINA, GORRASI, SUSANNA (2023). Flow Cytometric Investigation of *Salinicola halophilus* S28 Physiological Response Provides Solid Evidence for Its Uncommon and High Ability to Face Salt-Stress Conditions. MICROBIOLOGY RESEARCH, vol. 14, p. 454-465, ISSN: 2036-7481, doi: 10.3390/microbiolres14020034.
39. GORRASI, SUSANNA, FRANZETTI, ANDREA, BRANDT, ANGELIKA, MINZLAFF, ULRIKE, PASQUALETTI, MARCELLA, FENICE, MASSIMILIANO (2023). Insights into the prokaryotic communities of the abyssal-hadal benthic-boundary layer of the Kuril Kamchatka Trench. ENVIRONMENTAL MICROBIOME, vol. 18, ISSN: 2524-6372, doi: 10.1186/s40793-023-00522-9.
40. GORRASI, SUSANNA, BRANDT. ANGELIKA, PITTINO. FRANCESCA, FRANZETTI, ANDREA, PASQUALETTI, MARCELLA, MUÑOZ-PALAZON, BARBARA, NOVELLO, GIORGIA, FENICE, MASSIMILIANO (2023). Uncovering the prokaryotic diversity of the bathyal waters above the Kuril–Kamchatka Trench. JOURNAL OF MARINE SCIENCE AND ENGINEERING, vol. 11, ISSN: 2077-1312, doi: 10.3390/jmse1111214