

Curriculum Vitae Andrea Polo

Personal information

Name: **Andrea Polo**
Place and date of birth: **Conselve (PD), 29th September 1982**
Nationality: **Italian**
Telephone numbers: +39 0471 017143
E-Mail: andrea.polo@unibz.it

Education since leaving school

- 2010. PhD school in Molecular Sciences and Plant, Food and Environmental Biotechnologies, PhD course in Chemistry, Biochemistry and Ecology of Pesticides. University of Milan – Agricultural Faculty, Department of Food Science, Technology and Microbiology (DiSTAM). PhD thesis: “The control of deleterious biofilm on abiotic surfaces: from a more sustainable use of biocides to a new environmentally-friendly approach” (open access at air.unimi.it/handle/2434/150089).
- 2006. MSc. in Science and Technology for Archaeological and Artistic Heritage, 110/110 *cum laude* (degree awarded on 27th October 2006). University of Padova, Science, Engineering and Liberal Arts interfaculty.
- 2004. BSc. in Science and Technology for Cultural Heritage, 110/110 *cum laude* (degree awarded on 30th September 2004). University of Padova, Faculty of Natural Science.

Present appointment

- Title of appointment: “Microbial ecology study of fermented beverages and foods: from ecosystem analysis to starter culture development”
- start of appointment: 01/10/2018
- level of appointment: junior university researcher with fixed-term contract (RTDa)
- employer: Free University of Bozen, Faculty of Science and Technology
- brief description of responsibilities: study the structure and functions of the main microbial populations harboring beverages and fermented foods; monitoring of the evolution over time of microbial communities in order to understand the role of the microbiota in the ecosystem of interest; selection of tailored starter enabling improved efficiency of fermentation and enhancement of the studied ecosystems.

Professional experience (previous employments)

From / to	Job title	Name of academic Institution / employer	Role
March 2016 – July 2018	Formazione e sviluppo di una rete di ricerca transdisciplinare Ambiente & Salute in Alto Adige nell’ambito dell’ufficio di coordinamento (TER)	Free University of Bozen, Faculty of Science and Technology	Postdoctoral fellow
March 2015 – March 2016	S.I.P.O.F.A in Sierra Leone: participate entrepreneurial development for optimisation of cashew production chain in Sierra Leone (Food security programme for vulnerable communities funded by CARIPLO Foundation)	COOPI – International Cooperation, Milan, Italy	Project Manager
January 2015	Assessing the microbiological risk to manuscripts stored in the degree thesis archive of University of Milan	University of Milan, Department of Food, Environmental and	Postdoc researcher

		Nutritional Sciences (DeFENS), Milan, Italy	
November 2014	Teaching	Istituto Comprensivo Statale "Don Paolo Galliero", Tribano (PD), Italy	Teacher
October 2014	Analysis and identification of fungal communities living on plaster	University of Milan, Department of Food, Environmental and Nutritional Sciences (DeFENS), Milan, Italy	Postdoc researcher
September 2014	Evaluation of the effects of zosteric acid on the polysaccharide fraction of extracellular polymeric matrix in microbial biofilm	Programme "Stage in SIMTREA laboratory" funded by the Italian Society for Agriculture, Food and Environmental Microbiology (SIMTREA)	Research prize spent at the University of Florence. Department of Agrifood Production and Environmental Sciences
April 2014 – May 2014	Lectureship at the University of Makeni (Sierra Leone).	University of Makeni, Faculty Agriculture and Food Sciences, Makeni, Sierra Leone	Lecturer
June 2012 – January 2014	Novel materials for medical devices based on biofunctionalized surfaces with antifouling properties (ANFOMAT, http://www.anfomat.unimi.it/)	University of Milan, Department of Food, Environmental and Nutritional Sciences (DeFENS), Milan, Italy	Postdoctoral fellow
May 2011 – May 2012	New non-toxic antifouling technologies for wastewater filter surfaces	University of Milan, Department of Food Science, Technology and Microbiology (DISTAM), Milan, Italy	Postdoctoral fellow
November 2010 – May 2011	Study of microbial biodeteriogen communities on surfaces of Richini's Courtyard (University of Milan) and on adjacent air	University of Milan, Department of Food Science, Technology and Microbiology (DISTAM), Milan, Italy	Postdoctoral fellow
November 2007 - October 2010	The control of deleterious biofilm on abiotic surfaces: from a more sustainable use of biocides to a new environmentally-friendly approach	University of Milan, Department of Food Science, Technology and Microbiology (DISTAM), Milan, Italy	PhD student
June 2007 – October 2007	Microbial biotechnology applied to the remediation of cultural heritage	University of Milan, Department of Food Science, Technology and	Fellow

		Microbiology (DISTAM), Milan, Italy	
February 2007 – May 2007		R&C Lab S.r.l., Altavilla Vicentina (VI), Italy	Qualified laboratory technician

Awards

- Prize “Stage in SIMTREA laboratory” by the Italian Society for Agriculture, Food and Environmental Microbiology (SIMTREA) to the research project “*Evaluation of the effects of zosteric acid on the polysaccharide fraction of extracellular polymeric matrix in microbial biofilm*”, 20th June 2014.
- Prize given to the MSc thesis by the Province of Trento (Italy), Italy on 26th June 2007.

Teaching

Graduate courses leading to a Bachelor of Science and Master of Science degrees:

- Lecturer of the course “Nutrition and Health: the Functional Foods”, Free University of Bozen.
- Lecturer of the course “Fermentation processes for the production of mountain wines”, Free University of Bozen.
- Lecturer of the course “Agricultural microbiology” (48 hours). Bachelor of Science in Agriculture and Food Technology Sciences at the University of Makeni (Sierra Leone), academic year 2013-2014.

Courses for PhD students:

- “Food-human axis: the gut microbiome”, PhD course in food engineering and biotechnology, Free University of Bozen.
- “Meta-omics approaches to study the food fermentations”, PhD course in food engineering and biotechnology, Free University of Bozen.

Lab teaching in graduate courses leading to a Bachelor or Master of Science degrees:

- “Food Microbiology”, degree course in “Agricultural and agro-environmental science”. Free University of Bozen.
- “Microbiology for cultural heritage”, degree course in “Science and Technology for Cultural Heritage Conservation”. University of Milan.
- “Agricultural microbiology”, degree course in Agricultural Science and Technology. University of Milan.

Non-academic courses:

- “Bacteria for the remediation of cultural heritage”, in the course of “Biology applied to conservation” by Accademy of Fine Arts of Brera, Milano, Italy, 2013.
- “The removal of chemical alterations from stone by bio-cleaning techniques” (8h), in the course of “The conservation of contemporary arts” by Academy of Fine Arts of Brera, Milano, Italy, 2011.
- “Fundamentals of microbiology”, post-A Level course of technician for the restoration of cultural heritage at “ENGIM Veneto – Formazione, Orientamento Cooperazione”, Vicenza, Italy, school year 2014, 2016 and 2017.
- “Biotechnologies applied to cultural heritage conservation”, refresher course for restorers entitled “Innovative technologies for cleaning, consolidation and protection” funded by Veneto Region, Thiene (VI), Italy, 2012.
- “Microbiology and botany connected to the deterioration of stone surfaces”, education course of technician for the reconnaissance and digital elaboration of archaeological stone heritage of Lombardia Region funded by Government Department Responsible for Archeological Monuments of Lombardia Region, Capo di Ponte (BS), Italy, 2012.

Co-supervision of 10 Bachelor and 2 Master students.

Publications

Journal articles in refereed academic journals.

Current h-index: 10 (www.scopus.com, April 2019).

1. **Polo A.**, Cappitelli F., Villa F., Pinzari F. 2017. Biological invasion in the indoor environment: the spread of *Eurotium halophilicum* on library materials, *International Biodeterioration & Biodegradation*, 118, 34-44. IF (2015) 2.429. DOI: 10.1016/j.ibiod.2016.12.010
2. Okpalanozie O.E., Adebusoye S.A., Troiano F., **Polo A.**, Cappitelli F., Ilori M.O. 2016. Evaluating the microbiological risk to a contemporary Nigerian painting: molecular and biodegradative studies, *International Biodeterioration & Biodegradation*, 114, 184-192. IF (2015) 2.429. DOI: 10.1016/j.ibiod.2016.06.017
3. Villa F., Secundo F., **Polo A.**, Cappitelli F. 2015. Immobilized hydrolytic enzymes exhibit antibiofilm activity against *Escherichia coli* at sub-lethal concentrations. *Current Microbiology*, 71(1), 106-114. IF (2013) 1.359. DOI: 10.1007/s00284-015-0834-6
4. Sanmartín P., Villa F., **Polo A.**, Silva B., Prieto B., Cappitelli F. 2015. Rapid evaluation of three biocide treatments against the cyanobacterium *Nostoc* sp. PCC 9104 by color changes. *Annals of Microbiology*, 65, 1153-1158. IF (2013) 1.039. DOI: 10.1007/s13213-014-0882-3
5. Balloi A., Lombardi E., Troiano F., **Polo A.**, Capitelli F., Gulotta D., Toniolo L., Lucchini A., Daffonchio D. 2015. Sulfate reducing bacteria as bio-cleaning agents: development of new methodologies and study cases. *Conservation science in cultural heritage*, 15(2), 109-119. IF (2015) 0.037. DOI: 10.6092/issn.1973-9494/7123
6. **Polo A.**, Foladori P., Ponti B., Bettinetti R., Gambino M., Villa F., Cappitelli F. 2014. Evaluation of zostric acid for mitigating biofilm formation of *Pseudomonas putida* isolated from a membrane bioreactor system. *International Journal of Molecular Sciences*, 15, 9497-9518. IF (2013) 2.339. DOI: 10.3390/ijms15069497
7. Troiano F., **Polo A.**, Villa F., Cappitelli F. 2014. Assessing the microbiological risk to stored 16th Century parchment manuscripts: a holistic approach based on molecular and environmental studies. *Biofouling*, 30(3), 299-311. IF (2013) 3.701. DOI: 10.1080/08927014.2013.871539
8. Cappitelli F., **Polo A.**, Villa F. 2014. Biofilm formation in food processing environments is still poorly understood and controlled, *Food Engineering Reviews*, 6, 29-42. IF (2013) 3.036. DOI: 10.1007/s12393-014-9077-8
9. Cappitelli F., Villa F., **Polo A.** 2014. Culture-independent methods to study subaerial biofilm growing on biodeteriorated surfaces of stone cultural heritage and frescoes. *Methods in Molecular Biology*, 1147, 341-366. IF (2013) 1.254. DOI: 10.1007/978-1-4939-0467-9_24
10. Troiano F., Gulotta D., Balloi A., **Polo A.**, Toniolo L., Lombardi E., Daffonchio D., Sorlini C., Cappitelli F. 2013. Successful combination of chemical and biological treatments for the cleaning of stone artworks. *International Biodeterioration & Biodegradation*, 85, 294-304. IF (2013) 2.235. DOI: 10.1016/j.ibiod.2013.08.011
11. **Polo A.**, Gulotta D., Santo N., Di Benedetto C., Fascio U., Toniolo L., Villa F., Cappitelli F. 2012. Importance of subaerial biofilms and airborne microflora in deterioration of stonework: a molecular study. *Biofouling* 28(10), 1093-1106. IF (2011) 4.429. DOI: 10.1080/08927014.2012.729580
12. Giacomucci L., Purdy K. J., Zanardini E., **Polo A.**, Cappitelli F. 2012. A new non-degenerate primer pair for the specific detection of the nitrite reductase gene, *nrfA*, in the genus *Desulfovibrio*. *Journal of Molecular Microbiology and Biotechnology* 22, 345-351. IF (2012) 1.679. DOI: 10.1159/000345768

13. **Polo A.**, Diamanti M. V., Bjarnsholt T., Høiby N., Villa F., Pedferri M. P., Cappitelli F. 2011. Effects of photoactivated titanium dioxide nanopowders and coating on planktonic and biofilm growth of *Pseudomonas aeruginosa*. *Photochemistry and Photobiology*, 87, 1387-1394. IF (2010) 2.679. DOI: 10.1111/j.1751-1097.2011.00972.x
14. **Polo A.**, Cappitelli F., Brusetti L., Principi P., Villa F., Giacomucci L., Ranalli G., Sorlini C. 2010. Feasibility of removing surface deposits on stone using biological and chemical remediation methods. *Microbial Ecology*, 60 (1), 1-14. IF (2009) 3.251. DOI: 10.1007/s00248-009-9633-6
15. Villa F., Giacomucci L., **Polo A.**, Principi P., Toniolo L., Levi M., Turri S., Cappitelli F. 2009. N-vanillylnonamide tested as a non-toxic antifoulant, applied to surfaces in a polyurethane coating. *Biotechnology Letters* 31, 1407–1413. IF (2008) 1.595. DOI: 10.1007/s10529-009-0031-4
16. Cappitelli F., Abbruscato P., Foladori P., Zanardini E., Ranalli G., Principi P., Villa F., **Polo A.**, Sorlini C. 2009. Detection and elimination of cyanobacteria from frescoes: The case of the St. Brizio Chapel (Orvieto Cathedral, Italy). *Microbial Ecology* 57(4), 633-639. IF (2008) 2.885. DOI: 10.1007/s00248-008-9441-4
17. Villa F., Cappitelli F., Principi P., **Polo A.**, Sorlini C. 2009. Permeabilization method for in-situ investigation of fungal conidia on surfaces. *Letters in Applied Microbiology* 48, 234-240. IF (2008) 1.679. DOI: 10.1111/j.1472-765X.2008.02520.x

Chapters in books

18. Molin G., **Polo A.** 2018. “Studio conservativo dei resti mortali di Francesco Petrarca” in „Imago animni – volti dal passato“. Editors: Luca Bezzi, Nicola Carrara, Marcello Nebl. Publisher: Litografia EFFE e ERRE, Trento, 47-52. ISBN 978-88-9776055-9
19. Cappitelli F., **Polo A.**, Troiano F. 2015. “Indagini microbiologiche sui manoscritti della Certosa di Pavia e dell’aria” in “La Certosa di Pavia. Tecnologie integrate per la conoscenza e la conservazione. Recenti scoperte nei locali inaccessibili”. Editors: Marco Martini, Carla Simone, Goffredo Haus, Pasquale Tucci, Maria Teresa Mazzilli Savini, Marco Morandotti, Susanna Bortolotto e Gabriele Guidi. Publisher: Silvana Editoriale ed., Cinisello Balsamo (Mi), 232-239. ISBN: 9788836631933
20. Cappitelli F., **Polo A.**, Sorlini C., Santo N., Fascio U., Di Benedetto C., De Bernardi F. 2013. “Indagini microbiologiche sulle superfici e sull’aria del Cortile” in “Il cortile del Richini un monumento da conservare”. Editors: Antonello Negri, Pasquale Tucci. Publisher: Skira, Milano, 211-220. ISBN: 885722214
21. Cappitelli F., **Polo A.**, Sorlini C. 2012. “Indagini microbiologiche delle superfici del cortile e dell’aria” in “Il cortile del Richini, un piano di conservazione programmata”. Publisher: Università degli Studi di Milano, Milano, 85-90. DOI (book): 10.4465/2012_PROGETTORICHINI; DOI (chapter): 10.4465/2012_PROGETTORICHINI_Cappitelli_Polo_Sorlini

Conference papers and abstracts

22. **Polo A.**, Cappitelli F., Villa F., Pinzari F. 2017. Fungal communities in library archives and the conservation of stored manuscripts: the case study of the archive of the University of Milan. In “Microbial Diversity 2017 – Drivers of microbial diversity”, proceedings of the congress of the Italian Society for Agriculture, Food and Environmental Microbiology (SIMTREA), 24th – 26th October 2017, Bari (Italy). Editors: Maria Calasso, Luca Cololin, Daniele Daffonchio, Maria De Angelis, Marco Gobetti, Sylvie Lortal, Fabio Minervini, Erasmo Neviani, Carlo Giuseppe Rizzello. Publisher: SIMTREA, San Casciano Val di Pesa (Fi), 466-467. ISBN: 978-88-943010-0-7
23. **Polo A.** 2014. “Biorestauro: batteri alleati dell’uomo nella conservazione delle opere d’arte”. Proceedings of the congress “I cippi di confine della Veneranda

Arca del Santo di Anguillara Veneta – Atti delle giornate di studio”, conference organised by Palinsesti Onlus Association, 10th – 11th October 2013, Anguillara Veneta (Italy). Editors: Serena Franceschi, Adelmo Lazzari. Publisher: Gieffe Edizioni srl, 51-54. ISBN:978-88-940847-0-2

24. **Polo A.**, Cappitelli F., Sorlini C. 2014. “Biorestauro: batteri alleati dell’uomo nella conservazione delle opere d’arte”. Proceedings of the congress “I batteri nel restauro. I principi, l’esperienza di laboratorio e i casi studio applicati dalla biopulitura al bioconsolidamento”, congress organized by Villa Fabris Foundation, 28th September 2013, Thiene (Italy). Editors: L. Becagli, S. Metaldi. Publisher: il prato, 9-12. ISBN: 978-88-6336-236-7
25. Gulotta D., Bertoldi M., Bortolotto S., **Polo A.**, Cappitelli F., Toniolo L. 2012. The Richini Courtyard in Milan: characterisation of the restoration materials and decay evaluation. In “A.I.Ar. 2012 – VII° Congresso Nazionale di Archeometria”, proceedings of the congress of the A.I.Ar Associazione Italiana di Archeometria, 22th – 24th February 2012, Modena (Italy). Editors: G. Vezzalini, P. Zannini. 1-8.
26. **Polo A.**, Cappitelli F., Giacomucci L., Troiano F., Cattò C., Sorlini C. 2011. Alterative microorganisms living on stone artworks exposed to environmental stress conditions. In “Microbial Diversity 2011 – Environmental stress and adaptation”, proceedings of the congress of the Italian Society for Agriculture, Food and Environmental Microbiology (SIMTREA), 26th – 28th October 2011, Milano (Italy). Editors: S. Casella, D. Daffonchio, M. Gobbetti, E. Parente. Publisher: SIMTREA, San Casciano Val di Pesa (Fi), 23-26.
27. Villa F., **Polo A.**, Principi P., Giacomucci L., Cappitelli F. 2009. New environmental friendly approaches against detrimental biofilms. In “The role of microbiology in agricultural, food and and environmental fields”, proceedings of the Second National Conference SIMTREA 10th – 12th June 2009, Sassari (Italy). Annals of Microbiology 59, Special Issue, 108.

Proceeding – edited

28. Water as a natural resource in a changing environment: quality, threats and sustainable use. Borruso L., Plagg B., **Polo A.**, Brusetti L., Zerbe S. (Eds.) 2017. Proceedings of TER congress (12th December 2017), Free University of Bozen.

Presentations at scientific conferences

- “Alterative microorganisms living on stone artworks exposed to environmental stress conditions” in “Microbial Diversity 2011 – Environmental stress and adaptation”, congress of the Italian Society for Agriculture, Food and Environmental Microbiology (SIMTREA), 26th – 28th October 2011, Milan (Italy).
- “Microbiological analysis on biofilms” in “Novel material for medical devices based on biofunctionalized surfaces with antifouling properties”, congress of ANFOMAT (Antifouling Materials) research project, University of Milan, 21th February 2014, Milan (Italy).
- “TER - Transdisciplinary Environment and Health Research Network South Tyrol” in “Transformative research and development in urban and regional environment” congress, 1th – 3th September 2016, Brixen (Italy).
- “Bacteria for the remediation of stone artworks” in “The boundary stones of *Veneranda Arca del Santo*”, conference organized by Palinsesti Onlus Association, 10th – 11th October 2013, Anguillara Veneta (Italy).
- “Bacteria: partners for the conservation of artworks” in “Bacteria and conservation science”, congress organized by Villa Fabris Foundation, 28th September 2013, Vicenza (Italy).

Conference participation

- 24th – 26th October 2017. “Microbial Diversity 2017 – Drivers of microbial diversity”, congress of the Italian Society for Agriculture, Food and Environmental Microbiology (SIMTREA). Bari, Italy.
- 4th – 8th Jun 2017. “14th Symposium on Bacterial Genetics and Ecology”, BAGECO 14, Aberdeen, Scotland.
- 1st – 3th September 2016. “Transformative research and development in urban and regional environment”, by Unibz, Bressanone (BZ), Italy.
- 18th – 20th September 2013. “57th National Meeting” by the Italian Society of Biochemistry and Molecular Biology (SIB). Ferrara, Italy.
- 10th May 2013. “Biology applied to cultural heritage: from diagnosis to conservation treatments” by the Center for Conservation and Restoration “la Venaria Reale”, Venaria (TO), Italy.
- 26th – 28th October 2011. “Microbial Diversity 2011 – Environmental stress and adaptation”, congress of the Italian Society for Agriculture, Food and Environmental Microbiology (SIMTREA). Milano, Italy.
- 2nd – 5th September 2009. “Eurobiofilms 2009” by Federation of European Microbiological Societies (FEMS), Roma, Italy.
- 31st May – 4th June 2009. “International Summer School 2009. New goals on environmental science” by the Italian Research Group on Pesticides and Environment (GRIFA), Villasimius (CA), Italy.
- 14th – 19th September 2008. “International Summer School 2008. Crop systems, Forestry, and Environmental Sciences” by the Italian Research Group on Pesticides and Environment (GRIFA), Metaponto (MT), Italy.
- 21st May 2008. “From RNA extraction to data analysis” by Applied Biosystems, University of Milan, Milan, Italy.
- 19th May 2008. “Meeting on confocal microscopy” by Department of Human Morphology (DMU), University of Milan, Milan, Italy.

Conference organisation

- Member of organization board for the congress “Water as a natural resource in a changing environment: quality, threats and sustainable use” by the Free University of Bozen. Bozen, 12th December 2017.
- Member of conference secretariat for the congress “Microbial Diversity 2011 – Environmental stress and adaptation” by the Italian Society for Agriculture, Food and Environmental Microbiology” (SIMTREA). Milan, 26th – 28th October 2011.

Memberships

- Member of the Italian Society for Agriculture, Food and Environmental Microbiology (SIMTREA), associated with FEMS, since March 2014.

Research experience in foreign laboratories

- May 2012. Research stay in the framework of the “VIGONI” program of the DAAD “Seagrass compounds inhibit biofilm formation – from the identification to the application”, at the Institut für Botanik, Leibniz Universität of Hanover, Germany, under the supervision of Prof.ssa Jutta Papenbrock. The aim of this research stay was to study the methods how to prepare and analyze plant samples mainly for phenolic compounds by HPLC.
- January 2010 – May 2010. Internship research at the Department of International Health, Immunology and Microbiology, Faculty of Health Sciences (Panum Institute), University of Copenhagen, Denmark, under the supervision of Prof. Niesl Høiby and Prof. Thomas Bjarnsholt. Title of the internship research project: “In vivo effects of photoactivated titanium dioxide on microbial biofilms”.
- August – September 2007. Research stay in the framework of the international project *CHCRT-2* “Investigation of stone deteriorating microbial strains and application of bioremediating microbial agents on Indian altered stone monument”, Agra, India. The aim of this research stay was to collect samples of

alteration of Indian monuments and to teach how to carry out biomolecular analysis on cultural heritage samples.

Reviewer of international journals

- Microbial Ecology
- Plos One
- Annals of microbiology
- Journal of Cultural Heritage

Other titles

- 2011. "Cultore della Materia" for the disciplines afferent to AGR/16 field assigned by the "Consiglio di Coordinamento Didattico" of Agricultural Faculty. University of Milan.
- 2016. "Qualifica di collaboratore restauratore di beni culturali - tecnico del restauro" by the Ministry of Cultural Heritage and Activities and Tourism (MiBACT)
- Degree in oboe (10/10) on 28th February 2005 by "F. Venezzes" Conservatory in Rovigo, Italy.

Language competence

Mother tongue: Italian

Other language (Self-assessment *European level based on Common European Framework of Reference for Languages*):

	Understanding				Speaking				Writing	
	Listening		Reading		Spoken interaction		Spoken production			
French	B2	Independent User	C1	Proficient User	B1	Threshold or intermediate	B1	Threshold or intermediate	B1	Threshold or intermediate
English	B2	Independent User	B2	Independent User	B2	Independent User	B2	Independent User	B2	Independent User
German	A2	Basic User	A2	Basic User	A2	Basic User	A2	Basic User	A2	Basic User