Personal information

Name – Second Name	**Giulia Santunione**
Place and date of birth	Formigine, MO-IT, 12/06/1988
Residence	Piazza Tricolore 13, 41043 Formigine, Modena, Italy
E-mail	giulia.santunione@unimore.it
Mobile	+ 39 3384806753
Fiscal Code	SNTGLI88H52D711C

Professional Experience

15/04/2023 – Now
Researcher T.D type A
SSD: BIO/03 Environmental and Applied Botany
Life Science Department – University of Modena and Reggio Emilia

16/02/2022 – 15/02/2023
Research Fellow
Department of Engineering "E. Ferrari" – University of Modena and Reggio Emilia
S.S.D.: BIO/03 Environmental and Applied Botany
Research project: Analysis of the effectiveness of the gasification pyro-weeding - treatment - FAR project of University Research Fund 2020 (CUP E92F20000640001)

01/03/2017 – 31/10/2018
Research Fellow
Department of Engineering "E. Ferrari" – University of Modena and Reggio Emilia
S.S.D.: BIO/03 Environmental and Applied Botany
Research project: Ergonomics, comfort and efficiency of use of automatic machines: analysis of the aging dynamics of materials with high solar reflectance relevant for comfort in the environments where automatic packaging machines are used - physical and biological aspects - POR FESR PATTERN Axis 1 Research and Innovation project

01/03/2016 – 28/02/2017
Research Fellow
Department of Engineering "E. Ferrari" – University of Modena and Reggio Emilia
S.S.D.: BIO/03 Environmental and Applied Botany
Research project: Analysis of the aging dynamics of materials with high solar reflectance: physical and biological aspects

01/05/2014 – 28/02/2016
Research grant
Bioboost srls (Modena) in collaboration with Department of Engineering "E. Ferrari" - University of Modena and Reggio Emilia;
Research project: "BMP analysis "

Education and Training

1/11/2018 - 31/01/2022
PhD Course - Industrial and Environmental Engineering
XXXIV Cycle, A.Y. 2020-2021 Department of Engineering "E. Ferrari" – University of Modena and Reggio Emilia (UniMORE)
Tutor: Prof. Alberto Muscio
Co-Tutor: Prof. Elisabetta Sgarbi
S.S.D.: BIO/03 Applied Environmental Botany
PhD thesis title: "A novel method to accelerate biodeterioration process on cool building surfaces: experimental setup development, environmental related-aspects analysis and predictive model validation"
Achieved cum laude

13-14/12/2021
IV° Electron and confocal microscopy course in botany

Centro Interdipartimentale Grandi Strumenti – University of Modena and Reggio Emilia

Gennaio 2019 **Writing Scientific Articles in English and Presenting research International conferences;**
University of Modena and Reggio Emilia

12-13/10/2017 **School of Biochar – Biochar, a new opportunity for cultivation substrates and technical soils**

Firenze, Osservatorio Ximeniano – Associazione ICHAR

15/09/2017 **Agrochar conference: Biochar, Compost in Mediterranean areas: synergies and opportunities to mitigate climate change**
Florence, Georgofili Academy

17-19/05/2016 **Course for Internal Auditor of Laboratories according to the standard ISO/IEC 17025**
Milan, UNICHIM

13-15/06/2016 **Workshop Pioneer into Practice – Climate KIC- European Institute of Innovation & Technology -EIT**
Agenzia per l'Energia e lo Sviluppo Sostenibile, Modena

30/09/2015 - Now **Technician** Measurements of surface radiative properties of materials according to the standards ASTM E903, ASTM C1371, ASTM C1549, ASTM E1980, UNI EN 15976, ASTM D7897, carried out according to the ISO/IEC 17025 standard c/o Energy Efficiency Laboratory (EELab), laboratory of the Engineering Department "E. Ferrari", University of Modena and Reggio Emilia, accredited with ACCREDIA.

19/03/2015 – 28/04/2015 **Training Course "Esperto MaIn Europeo" -** Agency for Energy and Sustainable Development AESS - Modena "Intelligent building materials: Cool roofs and cool pavements"

December 2012 **Qualification to the profession of Biologist**
University of Modena and Reggio Emilia

October 2010 – october 2012 **Master Degree - Biology – L.M. 6**
Faculty of Biosciences and Biotechnology - University of Modena and Reggio Emilia - 110/110 cum laude

October 2007 – october 2010 **Bachelor degree Biological Science- C.L. 13**
Faculty of Biosciences and Biotechnology - University of Modena and Reggio Emilia - 105/110

Periods of study and research abroad

02/01/2020 – 18/01/2020 ***All Power Labs Inc.***, 1010 Murray St. Berkeley, **California**, USA
Main activities: Study and use of biochar in the composting process; Analysis and development of models related to the "Carbon multiplier effect"

01/10/2016 – 30/10/2016 **Technical University of Valencia (UPV) -** Pioneer Into Practice Program Climate KIC - EIT –- Research Institute of Water and Environmental Engineering (IIAMA)
Tutor: Prof Miguel Martin Monerris;
Main activities: Study and analysis of phytoremediation processes with *Celtis australis* in the context of the "Albufera" naturalistic area, Valencia, **Spain**

Teaching and workshop

Role of parks in urban areas for climate change mitigation
A.Y. 2022-2023 CONFERENCE " CAMPAIGN OF RESISTANCE", Municipality of Modena, 21 April 2023

A.Y. 2022-2023 Workshop: "In vitro cultures of algae and cyanobacteria: applications in the biotechnological and industrial fields";

	Course of Plant Biology, Degree Course in Biotechnology, Department of Life Sciences; – University of Modena and Reggio Emilia
20-22 october 2022	"Il Sapere aumenta il sapore", 2022 edition of "Science Month", Biblioteca A. Delfini, Modena; Laboratory activities for schools and citizens "Is it just a grain of wheat?"
A.Y. 2021-2022	Workshop: "Monocotyledon angiosperms: Liliales and Asparagales"; Terrestrial Plant Diversity Course, Degree Course in Natural Sciences, – University of Modena and Reggio Emilia;
A.Y. 2021-2022	Workshop: "Biochar, sustainable agriculture and climate change: relationships and potential"; Course in Energy Sustainability and Renewable Sources, Master's Degree Course in Civil and Environmental Engineering, University of Modena and Reggio Emilia
A.Y. 2020-2021	Workshop: "Biochar: is it the future for a sustainable agriculture?"; Course in Energy Sustainability and Renewable Sources, Master's Degree in Civil and Environmental Engineering, University of Modena and Reggio Emilia
A.Y. 2020-2021	Tutoring activities: for students in Agricultural and Food Sciences and Technologies, "Plant Biology" course SSD: BIO/03 Environmental and Applied Botany
A.Y. 2019-2020	Workshop: "Algae and cyanobacteria: cytology and applications in biotechnology"; Course of Plant Biology, Degree Course in Agricultural and Food Sciences and Technologies, Department of Life Sciences; – University of Modena and Reggio Emilia
A.Y. 2019-2020	Tutoring activities for students in Agricultural and Food Sciences and Technologies, "Plant Biology" course SSD: BIO/03 Environmental and Applied Botany
January 2019- Now	Co-supervisor of 3 master's degree theses on topics related to the study of the growth of plant organisms also in response to environmental stress and interdisciplinary issues such as the energy valorisation of biomass c/o the Department of Life Sciences, Department of Engineering "E. Ferrari", Department of Chemical and Geological Sciences, University of Modena and Reggio Emilia; co-supervisor of 6 bachelor thesis in Biotechnology, Biological Sciences and Natural Sciences (Unimore)

Scientific publications

International Journal:

1. Sgarbi, E., Santunione, G., Barbieri, F., Montorsi, M., Lancellotti, I., Barbieri, L., Effects of LED Lights and New Long-Term-Release Fertilizers on Lettuce Growth: A Contribution for Sustainable Horticulture (2023), Horticulturae, Volume 9, https://doi.org/10.3390/horticulturae9030404
2. Puglia, M., Morselli, N., Lumi, M., **Santunione, G.**, Pedrazzi, S., Allesina, G. Assessment of hemp hurd-derived biochar produced through different thermochemical processes and evaluation of its potential use as soil amendment (2023), Heliyon, Volume 9, https://doi.org/10.1016/j.heliyon.2023.e14698
3. Ottani, F., Parenti, M., **Santunione, G.**, Moscatelli, G., Khan, R., Pedrazzi, S., Allesina ,G. (2023), Effects of different gasification biochar grain size on greenhouse gases and ammonia emissions in municipal aerated composting processes, Journal of Environmental Management, Volume 331, https://doi.org/10.1016/j.jenvman.2023.117257
4. Montevecchi, G., **Santunione, G.,** Licciardello, F., Köker, Ö., Masino, F., Antonelli, A. (2022) Enrichment of wheat flour with Spirulina: Evaluation

of thermal damage to essential amino acids during bread preparation, Food Research International; Volume 157, https://doi.org/10.1016/j.foodres.2022.111357

5. **Santunione, G.**, Muscio, A. Sgarbi, E., (2022), An experimental protocol using *N. commune* as pioneer organism to induce bio-deterioration of surfaces: comparison between new and soiled surfaces, International Journal of Environmental Studies; http://dx.doi.org/10.1080/00207233.2022.2044699
6. Pedrazzi, S., **Santunione, G.**, Mustone, M., Cannazza, G., Citti, C., Francia, E., Allesina, A., (2021) Techno-economic study of a small scale gasifier applied to an indoor hemp farm: from energy savings to biochar effects on productivity, Energy Conversion and Management; Volume 228, https://doi.org/10.1016/j.enconman.2020.113645
7. Despini, F., **Santunione, G.**, Barbieri, T., Tommasone, S., Muscio, A., Teggi, S. (2021) Urban surfaces analysis with remote sensing data for the evaluation of UHI mitigation scenarios, Urban Climate; Volume 35 https://doi.org/10.1016/j.uclim.2020.100761
8. Santangelo, P.E., **Santunione, G.**, Muscio, A. (2019) Experimental methodology for quantitative assessment of heat-wrap thermal transient behavior, Medical Engineering & Physics; Volume 69, pp.72-84, https://doi.org/10.1016/j.medengphy.2019.05.003
9. Pedrazzi, S., **Santunione, G.**, Minarelli, A., Allesina, G. (2019) Energy and biochar co-production from municipal green waste gasification: A model applied to a landfill in the north of Italy, Energy Conversion and Management; Volume 187, pp.274-282, https://doi.org/10.1016/j.enconman.2019.03.049
10. **Santunione, G.**, Ferrari, C., Siligardi, C., Muscio, A., Sgarbi, E., (2019) Accelerated biological ageing of solar reflective and aesthetically relevant building materials, Advances in Building Energy Research; Volume 13(2), pp. 264-281; https://doi.org/10.1080/17512549.2018.1488616
11. Allesina, G., Pedrazzi, S., Allegretti, F., Morselli, N., Puglia, M., **Santunione, G.**, Tartarini, P. (2018) Gasification of cotton crop residues for combined power and biochar production in Mozambique, Applied Thermal Engineering; Volume 139, pp. 387-394; https://doi.org/10.1016/j.applthermaleng.2018.04.115
12. Ferrari C., **Santunione G.**, Libbra A., Muscio A., Sgarbi E., Siligardi C., Barozzi G.S., (2015) Review on the influence of biological deterioration on the surface properties of building materials: organisms, materials, and methods, International Journal of Design & Nature and Ecodynamics; Volume 10, (1), pp. 21 – 39; https://doi.org/10.2495/DNE-V10-N1-21-39

Proceedings of international conferences; participation as a speaker

13. **Santunione, G.**, Barbieri, A., Sgarbi, E., Analysis of particulate matter (PM) trapped by four different shrub species in an urban forest: quantification and characterization, (2022), 117° Congresso Società Botanica Italiana (SBI), 7-9 Settembre 2022, Bologna, ISBN 978-88-85915-27-5.
14. **Santunione, G.**, Guidetti, R., Parenti, M., Ottani, F., Rebecchi, L., Sgarbi, E., Co-composted biochar and compost on multi grass meadow: an evaluation of the effects on plants growth and pedofauna biodiversity,

(2022) European Biomass Conference and Exhibition Proceedings, (30th EUBCE) 9-12 Maggio 2022, online**.**

15. Patelli, N., **Santunione, G.**, Ottani, F., Pedrazzi, S., Allesina, G., Biochar water retention capacity in greenhouse cultivation of *Cannabis sativa* L., (2022) European Biomass Conference and Exhibition Proceedings, (30th EUBCE) 9-12 Maggio 2022, online.
16. **Santunione, G.,** Muscio, A., Sgarbi, E., Biodeterioration of surfaces: the development of an experimental protocol involving *Nostoc commune* as pioneer organism (2021), 116° Congresso Società Botanica Italiana, 8-10 Settembre 2021, online, ISBN 978-88-85915-26-8.
17. Sgarbi, E., **Santunione, G.,** Montevecchi G., Masino F., Metabolites production in algae exposed to UV-B stress (2021), 116° Congresso Società Botanica Italiana (SBI), 8-10 Settembre 2021, online, ISBN 978-88-85915-26-8.
18. **Santunione, G.,** Ferrari, C., Muscio, A., Sgarbi, E., On bio-deterioration of Solar Reflective Materials: an innovative experimental procedure to accelerate the ageing process of surfaces, Proceedings of the 15th International Conference on Durability of Building Materials and Components (DBMC 2020), 20 - 23 Ottobre 2020, Barcellona (Spagna), online, pp. 1055–1062, DOI 10.23967/dbmc.2020.194.
19. **Santunione, G.,** Muscio, A., Sgarbi, E., Il bosco urbano come strategia di mitigazione microclimatica: un caso-studio a Reggio Emilia (2020), 115° Congresso Società Botanica Italiana (SBI), 9-11 Settembre 2020, online.
20. **Santunione, G.**, Turi, E., Paris, R., Francia, E., Montanari, M., Cannazza, G. (2020) Production and use of co-composted biochar as soil amendment for *Cannabis sativa* sp. Growth, European Biomass Conference and Exhibition Proceedings, (28th e-EUBCE), 6-9 Luglio 2020, Marsiglia (Francia) online, DOI: 10.5071/28thEUBCE2020-1DV.1.3.
21. Ferrari, C., Despini, F., **Santunione, G.,** Barbieri, T., Tommasone, S., Muscio, A., Teggi, S., Urban surfaces identification and characterization with remote sensing data and evaluation of possible mitigation alternatives (2019), 5th International Conference on Countermeasures to Urban Heat Islands (IC2UHI) – Hyderabad, (India), 2-4 Dicembre 2019
22. **Santunione, G.,** Ferrari, C., Muscio, A., High albedo plant selection for mitigation of the urban heat island (2019), 5th International Conference on Countermeasures to Urban Heat Islands (IC2UHI) – Hyderabad, (India), 2-4 Dicembre 2019.
23. **Santunione, G.,** Boni G., Sgarbi, E., Effects of abiotic stress induced by a standard mix of atmospheric pollutants in *Chlorella mirabilis*, (Chlorophyceae), (2019), 114° Congresso Società Botanica Italiana, Orto Botanico Padova, 4-6 Settembre 2019, ISBN 978-88-85915-23-7.
24. **Santunione, G.**, Bigi, A., Puglia, M., Morselli, N., Sebastianelli, L., Tartarini, P. Study of copper content distribution through the thermochemical conversion chain of vine pruning biomass (2019) European Biomass Conference and Exhibition Proceedings, (27th EUBCE) 27-30 Maggio 2019, Lisbona (Portogallo), pp. 1952-1956. DOI: 10.5071/27thEUBCE2019-ICV.1.9
25. **Santunione, G.,** Ferrari, C., Sgarbi, E., Muscio, A., An innovative method to sudy the interaction between pollutants and micro-algae within a project on bio-fouling of building materials and cultural heritage (2017)

2nd International Conference Green Conservation of Culture Heritage, Palermo, 16-18 Novembre 2017.

Proceedings of international and national conferences; participation as co-author

26. Sgarbi, E., Ranieri, R., **Santunione, G.**, L'effetto della tecnologia TIS (Temporary Immersion System) sullo sviluppo in vitro di *Himantoglossum robertianum* (Loisel.) P. Delforge (Orchidaceae), (2022), IV Convegno Nazionale sulla Micropropagazione - Vitro SOI, 12-14 Ottobre 2022, Bari.
27. Morselli, N., Puglia, M., Balboni, C., Ottani, F., Parenti, M., **Santunione, G.**, Pedrazzi, S., Allesina, G., Tartarini, P. A low impact alternative to common weed control systems: the case of syngas-powered flame weeding (2021) European Biomass Conference and Exhibition Proceedings, (29th e-EUBCE) 26-29 Aprile 2021, Marsiglia (Francia), online, pp. 233-236. DOI: 10.5071/29thEUBCE2021-1CV.1.13
28. Ottani, F., Parenti, M., **Santunione, G.**, Pedrazzi, S., Allesina, G. Co-composted biochar (Combi) production and its effects on *Ocimum basilicum* plants growth, (2021) European Biomass Conference and Exhibition Proceedings, (29th e-EUBCE) 26-29 Aprile 2021, Marsiglia (Francia), online, pp. 237-242, DOI: 10.5071/29thEUBCE2021-1CV.1.15
29. Pedrazzi, S., Morselli, N., Puglia, M., **Santunione, G.,** Parenti, M., Ottani, F. Hemp by-product valorization, (2020) European Biomass Conference and Exhibition Proceedings, (28th e-EUBCE) 6-9 Luglio 2020, pp. 50-54. DOI: 10.5071/28thEUBCE2020-1CV.4.3.
30. Sgarbi, E., Ranieri, R., **Santunione, G.**, Effect of Temporary Immersion System on in vitro development of *Himantoglossum robertianum* (Loisel.) P. Delforge (Orchidaceae), (2019), 114° Congresso Società Botanica Italiana, Orto Botanico Padova, 4-6 Settembre 2019, ISBN 978-88-85915-23-7.
31. Ferrari, C., **Santunione, G.**, Libbra, A., Muscio, A., Sgarbi, E., How accelereted biological ageing can affect solar reflective polymeric based building materials, (2017) 35th Italian Union of Thermo-Fluid Dynamics Heat Transfer Conference, UIT Ancona 26 - 28 Giugno 2017; Journal of Physics: Conference Series, Vol. 923, DOI 10.1088/1742-6596/923/1/012046.
32. **Santunione, G.**, Libbra, A., Muscio, A., Cool roofs with high solar reflectance for the welfare of dairy farming animals, 34th Italian Union of Thermo-Fluid Dynamics Heat Transfer Conference, UIT, Ferrara 4 - 6 Luglio 2016, Journal of Physics: Conference Series, Vol. 796 (1), DOI: 10.1088/1742-6596/796/1/012028.

Proceedings of national congresses and workshops; participation as a speaker

33. **Santunione, G.**, Sgarbi, E., Muscio, A., A novel method to accelerate biodeterioration process on cool building surfaces (2022), XXVI Convegno A.I.P.T, 23 Settembre 2022, Modena, A.I.P.T. Proceedings.
34. **Santunione, G.**, Ferrari, C., Sgarbi, E., Muscio A., Verso una procedura standard per l'invecchiamento biologico accelerato di campioni di superfici edili, (2019), XXV Convegno A.I.P.T, 20 Settembre 2019, Ancona, AIPT Proceedings.
35. Baniasadi, M., **Santunione, G.,** Moradi, A., Tartarini, P. Zero-waste approach for combined energy and fertilizer production: The case of

Ravenna, Italy, (2019), AIP Conference Proceedings; 74th Conference of the Italian Thermal Machines Engineering Association, Modena 11-13 Settembre 2019, DOI 10.1063/1.5138746.

36. **Santunione, G.**, Ferrari, C., Libbra, A., Sgarbi, E., Muscio A. Misura e ottimizzazione della riflettanza solare di tetti verdi, (2016) XXII Convegno A.I.P.T., 23 Settembre 2016. Reggio Emilia, A.I.P.T. Proceedings.

PhD thesis

37. **Giulia Santunione**, A novel method to accelerate biodeterioration process on cool building surfaces: experimental setup development, environmental related-aspects analysis and predictive model validation. PhD School: Industrial and Environmental Engineering – XXXIV cycle, A.Y. 2020-2021.

Langueages knowledge

	General	Speaking	Written
English	B2	B2	B2
Italian	Native language		

Participation and/or collaboration in research projects

January 2020 – June 2021 **Response to abiotic stress and production of metabolites with bioactive action in microalgae**, Department of Life Sciences, University of Modena and Reggio Emilia, P.I.: Prof. E . Sgarbi

January 2019- october 2022 PON UNIHEMP - Use of industrial hemp biomass for energy production and new biochemicals (Cod. ARS01_00668)

Speeches at scientific dissemination events

07/10/2022 Relatrice presso il Festival dello Sviluppo sostenibile 2022: Valorizzazione dei sottoprodotti tramite produzione di biochar

01/10/2022 Participation as a speaker at the Smart Life Festival of Radio FSC Unimore with an intervention on Smart Food

02/10/2022 Participation as a speaker at the Smart Life Festival of Radio FSC Unimore with an intervention on Smart Cties

17-19 september 2021 Workshop within the Philosophy Festival c/o Delfini Library (Modena), in collaboration with the Botanical Garden of the University of Modena and Reggio Emilia " La libertà non è star sopra a un albero… "

13/10/2020 "Povero Clima...Poveri Noi!" Come e perché la salute sociale e la salute ambientale sono strettamente connesse, Carpi, Modena

17-19 Settembre 2016 Workshop for children and teenagers - Philosophy Festival c/o Biblioteca Delfini (Modena): "Vinca il migliore! L'agonismo nel mondo naturale dal nucleo atomico alla scala cosmica", in collaboration with Inco.scienza and Orto Botanico, University of Modena and Reggio Emilia

Grants

1. "IIT and ICT PhD Award – Enzo Ferrari" 2023

2. PhD cum Laude, PhD School: Industrial and Environmental Engineering, D.M. 45/2013 XXXIV Ciclo, A.Y. 2020-2021 Engineering Department "E. Ferrari" – University of Modena and Reggio Emilia (UniMORE)

Further information

2016-Now	Vice-president of the cultural association of scientific dissemination Inco.Scienza, Participation in several scientific dissemination activities. (https://www.inco-scienza.org/)
12/06/2019- now	Municipal Councilor in the Municipality of Formigine (Modena); President of the Environment Commission.

Formigine , 26/04/2023

In Fede