NICHOLAS S LORUSSO, PhD

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EDUCATION

October 2018, PhD in Ecology and Evolutionary Biology, Rutgers University
Under the advisement of Dr. P.J. Morin

Dissertation Title: Consequences of an inducible defense: The ecological and evolutionary repercussions of temporary colony formation in *Chlamydomonas reinhardtii*

In progress, Masters in Higher Education, University of North Texas
Anticipated completion: Fall 2025

May 2010, Bachelor of Science in Biology, Saint Bonaventure University

Non-degree coursework and development

EDUCATIONAL DEVELOPMENT and TRAINING

2019, Scientists Teaching Science Course, New York Academy of Sciences

In 2019 I completed and intensive 40 hour course offered by the New York Academy of Sciences titled "Scientists Teaching Science." This course was geared toward professional scientists and researchers seeking development of fundamental aspects of teaching and educational strategies

BIOINFORMATICS COURSEWORK and TRAINING

Environmental genomics (Mount Desert Island Biological Laboratory, 2014) – Intensive week long course in environmental genomics offered at the Mount Desert Island Biological Laboratory in the Summer of 2014. Covered techniques in sample preparation, quality control, and sequencing. Employed well described pipelines for processing raw reads, alignment, and analysis (e.g. differential gene expression, gene annotation, description, GO/GSEA). Included collecting, processing, and analyzing data collected from populations of *Daphnia pulex*.

Algal Genomics (Rutgers University, 2012) – Covered topics in comparative genomics and phylogenomics in the red alga *Porphyridium cruentum*.

RELEVANT EXPERIENCE

August 2021 – Present, Assistant Professor, University of North Texas at Dallas

I am currently an Assistant Professor in the department of Natural Sciences at the University of North Texas at Dallas. My responsibilities include teaching and designing courses for undergraduate students and I maintain a molecular ecology laboratory in which I mentor students and facilitate research focused courses. To date I have taught a range of courses ranging from introductory biology to upper level courses such as

microbiology, cell biology, animal physiology, wildlife management, medical terminology, and mentored independent research.

September 2019-August 2021, Lecturer II, Kean University

I served as a 12-month lecturer at Kean University in Union New Jersey teaching in the School of Natural Sciences. My responsibilities include teaching and designing courses for undergraduate students and I maintain a molecular ecology laboratory in which I mentor students and facilitate research focused courses. The courses I have offered at Kean include: General Biology (Majors and Non-majors), Zoology, Senior Biology Capstone, Microbiology, Biostatistics, and a microbiome focused research course. I have also developed two face-to-face courses (biostatistics and population genetics) and two fully online courses (general biology II and zoology), served on search committees, advised 50+ students, and served as co-chair of my departmental curriculum committee.

Spring 2019, Adjunct Professor instructing General Biology Laboratories, Rider University

Instructed a diverse pool of early undergraduates in general biology labs. Facilitated the development of writing skills through real time feedback and writing workshops.

Fall Semesters 2013-2018, Part-time Lecturer for Principles of Biology Laboratory, Rutgers University

Taught two Principles of Biology laboratories per week with up to 24 undergraduate students per section. Instructed non-biology majors in diverse concepts appropriate for an understanding in general biology. Designed new course materials and exercises. Served as Head TA from 2015-2017.

Spring Semesters 2015-2018, Part time Lecturer for Principles of Ecology Laboratory, Rutgers University

Developed, maintained, and handled procurement of supplies for laboratory exercises. Contributed to the development of new exercises, course materials, and lecture exam materials.

Fall 2014-Spring 2016, Instructor for the Prison Teaching Initiative, Princeton University

Volunteered to instruct college level courses in math and science for inmates in the New Jersey State correctional system seeking associates degrees given by Mercer County College. Courses taught: Algebra, Introduction to Statistics, Survey of Biological sciences

Fall and Spring Semesters 2016-2018, Instructor for Invertebrate Zoology, Behavioral Biology, and Principles of Ecology labs, Rutgers University

Instructed courses offered through the Department of Ecology, Evolution, and Natural resources at Rutgers University. Designed course materials and evaluations, developed new exercises, and mentored students seeking research experience.

Fall 2018, Instructor for Special Topics Course in Invasion Ecology, Rutgers University

Co-designed and taught a seminar style course in Invasion Ecology. Materials, lecture topics, and evaluations were all redesigned for Fall 2018 with a strong focus on current directions in Invasion Ecology research. The course also include strong elements of science communication (short presentation on current research and collaboratively writing a term paper using G suite by google) and collaboration in collecting, analyzing, and interpreting data from an ongoing old field invasion study.

Spring 2016 – Fall 2018, Mentor for undergraduate research in the laboratory of Dr. Peter Morin, Rutgers University

Supervised an independent research project with an undergraduate seeking laboratory experience. Helped students become familiar with sampling strategies for soil macroinvertebrates, proper experimental design, database management, and preliminary analyses. Students were involved at each stage of the research project and were given the opportunity to collect their own supplementary data and develop individual research questions within the scope of the larger project.

SOFTWARE and BIOINFORMATICS

Operating systems: Proficient in Linux/UNIX (ubuntu, ARCH, debian), Microsoft Windows, DOS

Programming languages: R, Perl, Python. Applied experience with Java, C++, and Ruby.

Bioinformatics applications: Proficient in processing and analyzing metagenomic and transcriptomic datasets using existing command line tools/workflows to move from raw reads through statistical analyses using R/Bioconductor. Familiar with underlying statistical methodology.

LABORATORY and FIELD EXPERIENCE

Training in: DNA/RNA extraction, PCR, gel electrophoresis, preparation of samples for production of NGS data. Field experience includes establishing experimental field sites, collection and isolation of species for establishment of laboratory culture, collection of a variety of types of field data.

PROFESSIONAL ROLES and HONOR SOCIEITES

2021 – Present, Horizon Publishing Group, Journal of Ecology and the Environment

Invited reviewer

2020 - Present, Phi Kappa Phi, National Research Honor Society

Induction: December 2019 – Member in good standing

AWARDS and FUNDING

2023, UNTD Faculty Senate Teaching Excellence Award, UNTD Faculty Senate

2023, Outstanding Faculty Mentor Award, Bridges Across Texas LSAMP

2019, Faculty Seed Grant, Kean University

$1500 grant toward funds for sequencing costs

2016-2018, Teaching Assistantship, Rutgers University

TA for Invertebrate Zoology (Fall) and Principles of Ecology (Spring)

2015, Rutgers Graduate Student Association Professional development fund, Rutgers University

$3500 grant toward funds for sequencing costs

2015, Hutcheson Memorial Forest Summer Research Grant, Rutgers University

$1500 grant to conduct research at Hutcheson Memorial Forest

2011-2013, Ted Stiles Memorial Award and Graduate Program of Ecology Small Grants, Rutgers University

$2500 grant to fund dissertation research

2012-2016, NSF IGERT Biofuels Trainee Fellowship, Rutgers University, Department of Plant Biology

Training fellow in NSF funded training fellowship, Project PI: Eric Lam

2011-2012, Graduate Assistantship, Rutgers University

Graduate research assistant for Hutcheson Memorial Forest

PUBLICATIONS, EDUCATIONAL RESOURCES, AND MANUSCRIPTS IN PREPARATION

1) Newcomer, K., Godfrey, S., Kumar, S., Lorusso, N., Patel, N., Garrett, B., ... & Sulistio, M. S. (2024). Increasing Knowledge about Implantable Cardioverter Defibrillators at the End of Life, an Effective Approach for Hospice Workers to Improve Patient Care. *Journal of Pain and Symptom Management*, *67*(5), e409-e415.

2) Gemmellaro, M. D., Lorusso, N. S., Domke, R., Kovalska, K. M., Hashim, A., Arevalo Mojica, M., ... & Shumskaya, M. (2023). Assessment of Fungal Succession in Decomposing Swine Carcasses (Sus scrofa L.) Using DNA Metabarcoding. *Journal of Fungi*, *9*(9), 866.

3) Godfrey, S., Peng, Y., Lorusso, N., Sulistio, M., Mentz, R. J., Pandey, A., & Warraich, H. (2023). Palliative Care for Patients With Heart Failure With Preserved Ejection Fraction. *Circulation: Heart Failure*, *16*(11), e010802.

4) Lorusso, N. S., & Gemmellaro, M. D. (2023). Identifying unknown specimens using predictive phylogenies for remote forensic education. *Biochemistry and Molecular Biology Education*, *51*(2), 200-201.

5) Shumskaya, M., Filippova, N., Lorentzen, L., Blue, S., Andrew, C., & Lorusso, N. S. (2023). Citizen science helps in the study of fungal diversity in New Jersey. *Scientific Data*, *10*(1), 10.

6) Shumskaya, M., Lorusso, N., Patel, U., Leigh, M., Somervuo, P., & Schigel, D. (2023). MycoPins: a metabarcoding-based method to monitor fungal colonization of fine woody debris. *MycoKeys*, *96*, 77.

7) Lambring, C., Varga, K., Livingston, K., Lorusso, N., Dudhia, A., & Basha, R. (2022). Therapeutic applications of curcumin and derivatives in colorectal cancer. *Onco therapeutics*, *9*(1).

8) Lorusso, N. S., & Faillace, C. A. (2022). Indirect facilitation between prey promotes asymmetric apparent competition. *Journal of Animal Ecology*. [Open Access]

9) Lorusso, N., Shumskaya, M., & Gemmellaro, D. (2022). Applying phylogenetic tree building in MEGA X to forensic applications for identifying unknown specimens. QUBES Educational Resources. doi:10.25334/XY5F-XQ54

10) Shumskaya, M, Benjamin, S. Niepielko, M.G., Lorusso. N.S. (2021). Statistics with epidemiology of COVID-19. QUBES Educational Resources. doi: 10.25334/H1HE-5Z05

11) Gemmellaro M, Villata J, Hamilton G, Lorusso N.S. (2021). First record of the secondary screwworm fly, *Cochliomyia macellaria* (Fabricius) (Diptera: Calliphoridae) in Northern New Jersey. New Jersey Academy of Sciences *62(1)* 10-13.

12) Lorusso, N. S., & Shumskaya, M. (2020). Online laboratory exercise on computational biology: Phylogenetic analyses and protein modeling based on SARS-CoV-2 data during COVID-19 remote instruction. *Biochemistry and Molecular Biology Education*, *48*(5), 526-527.

13) Shumskaya, M., Lorusso, N.S. (2020). Introduction to nucleotide sequence analysis and protein modeling in MEGA and PyMol using coronavirus SARS-CoV-2. QUBES Educational Resources. doi:10.25334/NC3X-TW70

14) Faillace, C.A., Lorusso, N.S., Duffy, S. 2016. Overlooking the smallest matter: viruses impact species invasions. *Ecology Letters*, 20(4), pp 524-538

15) Pollock, N.B., Howe, N., Irizarry, I., Lorusso, N., Kruger, A., Himmler, K. and Struwe, L., 2015. Personal BioBlitz: A New Way to Encourage Biodiversity Discovery and Knowledge in K–99 Education and Outreach. *BioScience*, 65(12), pp.1154-1164.

16) Lorusso, N.S. Exploitation of *Chlamydomonas reinhardtii*'s inducible colony defense: When is it best to sink or swim? [Under Review: Journal of Plankton Research, July 2024]

17) Lorusso, N.S. Differential gene expression in populations of the alga *Chlamydomonas reinhardtii* employing colonial phenotypes in response to various stressors [In Revision]

18) Lorusso, N.S. The tools at hand: Genetic contributions of anti-predator defenses in the development of permanent multicellularity [In Revision]

19) Lorusso, N.S. A first turn of the ratchet: Artificially selecting for increased fitness of *C. reinhardtii* defense colonies in multi-predator communities. [in prep]

PRESENTATIONS

June 2024 Ecological Society of America national meeting (ESA 2024)

Lorusso, N.S. (2024) Artificially selected increased suspension time for colony phenotypes improves inducible defense success in multipredator communities containing *Chlamydomonas reinhardtii* [Oral Contributed Presentation]

March 2024 Annual Assembly of Hospice and Palliative Care national meeting

Godfrey S, Kumar S, Lorusso N, Patel N, Garrett BS, Chen C, Sulistio MS, Newcomer K. (2024) Shocked at End-of-Life: Use of an Instructional Video to Educate Hospice Workers about Implantable Cardioverter-Defibrillators. [Poster]

March 2024 UT Southwestern Celebration of Women in Science and Medicine

Godfrey S, Viamontes C, Garrett B, Patel N, Lorusso N, Shah N, Newcomer K, Sulistio MS. (2024) Reducing Health Care Disparities by Improving ICD Knowledge in a Diverse Population, A Quality Improvement Initiative to Align ICD Settings with Goals of Care. [Poster]

March 2024 Texas Tech Undergraduate Research Conference

Enriquez, F., Co,M., Catellano,N., Deleon,M., Desta,D., Nino, G., Leija,M., Penelton,A., Raddad,B., Rico,H.I., Valero,B., Lorusso, N.S. (2024) Use of the ITS rRNA region metabarcoding to evaluate differences in fungal contribution to animal decomposition. Texas Tech Undergraduate research conference [Poster presentation]

McClanahan, M., Lorusso, N.S. (2024) Friends in Decomposition: Shared Contributions and Trajectories of Fire Ants (*Solenopsis invicta*) and Decompositional Fungi. Texas Tech Undergraduate research conference [Poster presentation]

Pendleton, A., Lorusso, N.S. (2024) Ecological ramifications of carrion placement for animal food webs. Texas Tech Undergraduate research conference [Poster presentation]

Rico, H.I., Co,M., Childs,M., Deleon,M., Desta,D., Enriquez,F., Herrera,L., Leija,M., Raddad,R., Sanchez,A., Scherzer-Penkauskas,H., Valero,B., Lorusso, N.S. (2024) Use of 16S rRNA gene

metabarcoding to determine seasonal differences in bacterial communities contributing to animal decomposition. Texas Tech Undergraduate research conference [Poster presentation]

February 2024 Texas-New Mexico Hospice and Palliative Care Organization Annual Conference

Godfrey S, Kumar S, Lorusso N, Patel N, Garrett BS, Chen C, Sulistio MS, Newcomer K. (2024) Shocked at End-of-Life: Use of an Instructional Video to Educate Hospice Workers about Implantable Cardioverter-Defibrillators. [Poster]

February 2024 American Academy of Forensic Science national meeting

Benassi, A; Raise, G; Lorusso, N.S.; Gemmellaro, M.D. (2024). The succession of invertebrate communities involved in swine decomposition in freshwater environments in Italy [Poster presentation]

June 2023 Ecological Society of America national meeting (ESA 2023)

Lorusso, N.S. (2023). When one size doesn't fit all: Inducible colony defense phenotypes exposed to diverse predator histories modify defense success in *Chlamydomonas reinhardtii* [Oral Contributed Presentation]

Herrera L., Dominguez A., Fanousi S., Hernandez. J, Samples S., Sanchez A., Shazad R., Lorusso N.S. (2023). Invasive plant species lower belowground bacterial diversity Invasive plant species lower belowground bacterial diversity. Texas Tech Undergraduate research conference [Poster presentation]

March 2023 Texas Tech Undergraduate Research Conference

Herrera, L., Dominguez, A., Fanousi, S., Hernandez, J, Samples, S., Sanchez, A., Shazad R., Lorusso, N.S. (2023). Invasive plant species lower belowground bacterial diversity Invasive plant species lower belowground bacterial diversity. Texas Tech Undergraduate research conference [Poster presentation]

Sanchez, A., Herrera, L., Dominguez, A., Fanousi, S., Hernandez, J, Samples, S., Shazad, R., Lorusso, N.S. Nicholas Lorusso (2023). Monitoring of environmental microbiota supporting the declining North American Hellbender (*Cryptobranchus allegheniensis*). Texas Tech Undergraduate research conference [Poster presentation]

Desta, D., Childs, M., Enriquez, F., Fanousi, S., Helbert, H., Herrera, L., Sanchez, A., Shazad, R., Gemmellaro, M.D., Lorusso N.S. (2023). Use of 16S rRNA metabarcoding to evaluate differences in stages of fetal pig decomposition. Texas Tech Undergraduate research conference [Poster presentation]

September 2022 Entomological Society of America

O'Connor, A.J., Raise, G, Urias S., Shumskaya, M., Lorusso N.S., and Gemmellaro, M.D. (2022) "Fungal succession on decomposing swine carcasses". Entomological Society of

America North East Regional meeting (poster)

Raise, G, O'Connor, A.J., Lorusso N.S., and Gemmellaro, M.D. (2022) "Effects of Acetaminophen on the development of *Phormia regina* (Meigen) (Diptera: Calliphoridae)". Entomological Society of America North East Regional meeting (poster)

June 2022 American Society of Microbiology Microbe

Lorusso, N.S. and Faillace, C.A. (2022) Consequences Of Facilitation Among Microbial Prey For Outcomes Of Apparent Competition: An Experimental Analysis. American Society of Microbiology Microbe (talk)

October 2021 American Association of Forensic Science

Gemmellaro, M.D., Domke, R., Kovalska, K., O'Connor, A.J., Pate, O., Raise, G., Lorusso, N., Shumskaya, M. (2022). Successional Changes in the Entomological, Bacteriological, and Fungal Communities During the Decomposition of Swine Carcasses. American Association of Forensic Science (talk)

August 2020 Ecological Society of America

Lorusso, N.S. "Working with what you have: Exploring the role of the colonial antipredator defense of *Chlamydomonas reinhardtii* in the development of permanent multicellularity" (talk)

August 2018 Ecological Society of America

Lorusso, N.S. and Faillace, C.F. Consequences of facilitation among prey for outcomes of apparent competition: An experimental analysis (talk)

June 2017 Evolution 2017

Lorusso, N.S. "Working with what you have: Exploring the role of the colonial antipredator defense of *Chlamydomonas reinhardtii* in the development of permanent multicellularity" (talk)

February 27, 2017 Association for the Sciences of Limnology and Oceanography

Lorusso, N.S. "Predator-Contingent Exploitation of and Inducible Defense: When is it best to sink or swim**"** (talk)

January 2016, Quantitative Ecology Conference, Cambridge MA

Lorusso, N.S. "Working with what you've got: how genes expressed in *Chlamydomonas reinhardtii*'s colony defense may have shaped the evolution of permanent multicelluarity in the volvocine algae" (poster)

January 2016, American Society of Naturalists, Pacific Grove CA

Lorusso, N.S. “Exploitation of an inducible colony defense: When is it best to sink or swim?” (talk)