Sungsik Kong | Curriculum Vitæ

Wisconsin Institute for Discovery – University of Wisconsin-Madison 330 N Orchard St Madison, WI. 53715, USA

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Summary

- I am a computational evolutionary biologist with trainings in biology, statistics, and bioinformatics.
- My research focuses on phylogenetic methods, phylogenetic networks, and reticulate evolution.
- I am adventurous and traveled in Asia for a year on foot, bicycle, and motorbike.

Professional Experience

Wisconsin Institute for Discovery

University of Wisconsin-Madison, WI., USA Mentor: Prof. Dr. Claudia R. Solís-Lemus 2023-Present

Postdoctoral research associate

Education

Ph.D. in Evolution, Ecology, and Organismal Biology

2018-2022

2022

The Ohio State University, Columbus, OH., USA

Presidential fellow

Dissertation: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories

Advisor: Prof. Dr. Laura S. Kubatko

M.Sc. in Ecology and Evolutionary Biology

2013-2015

University of Toronto, Toronto, ON., Canada

Thesis: On the use of Median-Joining networks: A philosophical and empirical evaluation of its suitability in evolutionary biology

Advisor: Prof. Dr. Robert W. Murphy

B.Sc. in Zoology and Ecology and Evolutionary Biology

2006-2012

University of Toronto, Toronto, ON., Canada

Undergraduate thesis advisors: Profs. Drs. Robert W. Murphy and Deborah A. McLennan

Publications

Total number: 18

h-index: 7 [Google scholar]

*Correspondence; [‡]Co-correspondence; [†]Equal contribution

Selected peer-reviewed journal articles......

- [18] Kong S*, Sánchez-Pacheco SJ, and Murphy RW. (2023) Median-Joining Networks and Bayesian phylogenies often do not tell the same story. *Bulletin of the Society of Systematic Biologists* 2:1 1–13 doi:10.18061/bssb.v2i-1.9625
- [17] Kong S (2022) Digest: Frequent hybridization in *Darevskia* rarely leads to the evolution of asexuality. *Evolution* 76:9 2216–2217 doi:10.1111/evo.14587
- [16] Kong S[†], Pons JC[†], Kubatko LS, and Wicke K. (2022) Classes of phylogenetic networks and their mathematical and biological significance. *Journal of Mathematical Biology* 84:47 doi:10.1007/s00285-022-01746-y
- [15] Kong S and Kubatko LS. (2021) Comparative performance of popular methods for hybrid detection using genomic data. *Systematic Biology* 70:5 891–907 doi:10.1093/sysbio/syaa092
- [14] Sánchez-Pacheco SJ[‡], Kong S[‡], Pulido-Santacruz P, Murphy RW, and Kubatko L. (2020) Median-joining network analysis of SARS-CoV-2 genomes is neither phylogenetic nor evolutionary. *Proc. Natl. Acad. Sci. U.S.A* 117:23 12518–12519 doi:10.1073/pnas.2007062117
- [13] Kong S[†], Sánchez-Pacheco S[†], and Murphy RW. (2016) On the use of Median-Joining Networks in evolutionary biology. *Cladistics* 32: 691–699 doi:10.1111/cla.12147

Collaborative peer-reviewed journal articles.....

- [12] Fu M, Eimes JA, Kong S, Lamichhaney S, Waldman B (2023) Identification of major histocompatibility complex genotypes associated with resistance to an amphibian emerging infectious disease. *Infection, Genetics and Evolution* 105470 doi:10.1016/j.meegid.2023.105470
- [11] Glon H, Häussermann V, Brewin P, Brickle P, Kong S, Smith M, and Daly M. (2023) There and back again: The unexpected journeys of *Metridium* de Blainville, 1824 between the old oceans and throughout the modern world. *Biological Bulletin* 244:1 doi:10.1086/723800
- [10] Nguyen HQ, Ho P-T, Kong S, Bae Y, Pham TH, and Jang Y. (2022) A time-calibrated mitogenomic phylogeny suggests that Korean *Hyalessa fuscata* is a bridge between Chinese and Japanese *H. maculaticollis*. *Journal of Genetics* 102:9 doi:10.1007/s12041-022-01405-7
- [9] Nguyen HQ, Kim E, Bae Y, Chae S, Ji S, Heo J, Kong S, Nguyen TK, Pham TH, and Jang Y. (2022) An effective method for accurate life-stage delimitation of cicadas. *Journal of Asia-Pacific Entomology* 101952 doi:10.1016/j.aspen.2022.101952
- [8] Glon MG, Broe MB, Crandall KA, Daly M, Kong S, Thoma RF, and Freudenstein JV. (2022) Anchored hybrid enrichment resolves the *Lacunicambarus* (Decapoda: Cambaridae) phylogeny. *Journal of Crustacean Biology* 42:1 ruab073 doi:10.1093/jcbiol/ruab073
- [7] Kim M, Nguyen HQ, Yi Y, Ahn J, Kim YE, Jang S, Kim S, Kong S, and Borzée A. (2020) Policy recommendation on whaling, trade and watching of cetaceans in the Republic of Korea. *Biodiversity Journal* 11: 255–258 doi:10.31396/Biodiv.Jour.2020.11.1.255.258

- [6] Weiringa JG, Boot MR, Dantas-Queiroz MV, Duckett D, Fonseca EM, Glon H, Hamilton N, Kong S, Lanna FM, Mattingly KZ, Parsons DJ, Smith ML, Stone BW, Thompson C, Zuo L, and Carstens BC. (2020) Does habitat stability structure intraspecific genetic diversity? It's complicated... Frontiers in Biogeography e45377 doi:10.21425/F5FBG45377
- [5] Borzée A, Purevdorj Z, Kim YI, Kong S, Choe M, Yi Y, Kim K, Kim A, and Jang Y. (2020) Breeding preferences in the Treefrogs *Dryophytes japonicus* (Hylidae) in Mongolia, the northern limit of their range. *Journal of Natural History* 53: 2685-2698 doi:10.1080/00222933.2019.1704458
- [4] Bae Y, Kong S, Yi Y, Jang Y, and Borzée A. (2019) Additional new type of threat to *Hynobius* salamander eggs: predation by loaches (*Misgurnus* sp.) in agricultural wetlands. *Animal Biology* 69:4 451–461 doi:10.1163/15707563-20191070
- [3] Groffen J, Kong S, Jang Y, and Borzée A. (2019) The invasive American bullfrog (*Lithobates catesbeianus*) in the Republic of Korea: history and recommendation for population control. *Management of Biological Invasions* 10:3 517–535 doi:10.3391/mbi.2019.10.3.08
- [2] Borzée A, Kong S, Didinger C, Nguyen HQ, and Jang Y. (2018) A ring-species or a ring of species? Phylogenetic relationship between two treefrog species around the Yellow Sea: *Dryophytes suweonensis* and *D. immaculatus*. The Herpetological Journal 28: 160–170
- [1] Kim K, Kong S, Kim YI, Borzée A, Bae Y, and Jang Y. (2018) Japanese hard ticks (*Ixodes nipponensis*) parasitizing on the endangered leopard cat (*Prionaliurus bengalensis euptilura*) in the Republic of Korea. *Animal Systematics, Evolution and Diversity* 34:1 23–26 doi:10.5635/ASED.2018.34.1.032

Policy recommendation....

[1] Borzée A, Nguyen HQ, Ahn J, Kim M, Kim S, Jang S, Kong S, Kim YE, and Yi Y. (2017) Policy recommendation on the negative impact of infrastructure development on the population of endangered Long-Tailed Goral in Oseck-Kkeutchong. Society for Conservation Biology Korean Chapter

Submitted

- [2] Kong S, Swofford DL, and Kubatko LS. (In Revision) Inference of phylogenetic networks from sequence data using composite likelihood. Preprint available on *bioRxiv* at 10.1101/2022.11.14.516468v1
- [1] Peng J, Kong S, and Kubatko L. (In Review) A likelihood ratio test for hybridization under the multispecies coalescent. Preprint available on *bioRxiv* at 10.1101/2023.06.20.545699

Talks and Presentations

*Virtual presentation

Invited talks.....

[17] Coming soon The International Society for Computational Biology (ISCB)* Society for Molecular Biology and Evolution

2023

EvolCompGen webinar series

Title: Inferring phylogenetic networks from sequence data using composite likelihood

[16] Society for Industrial and Applied Mathematics,

New York-New Jersey-Pennsylvania Section (SIAM-NNP),

New Jersey Institute of Technology, Newark, NJ., USA

Mathematics of Evolution Minisymposium

Title: Inferring phylogenetic networks from sequence data using composite likelihood

2023

[15]	University of Wisconsin-Madison, WI., USA UW-Madison Fall 2023 Evolution Seminar Series Title: PhyNEST: Phylogenetic Network Estimation using SiTe patterns	2023
[14]	University of Wisconsin-Madison, WI., USA UW-Madison Postdoctoral Research Symposium Blitz Talks Competition Title: Inferring phylogenetic networks from sequence data using composite likelihood	2023
[13]	Taming the BEAST, Squamish, BC., Canada Squamish BEAST Tamers Title: Species network estimation	2023
[12]	Botany Meeting, Boise, ID., USA Seeing the Network for the Trees: Methodological and Empirical Advances in Reticulate Evolution Sympose Title: Pitfalls of popular computational methods to understand reticulate evolution	2023 ium
[11]	Algorithms and Complexity in Phylogenetics* Title: Inferring phylogenetic networks from sequence data using composite likelihood Video recording available on YouTube [link]	2022
[10]	Indiana University, Bloomington, IN., USA Title: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary his	2022 tories
[9]	University of California San Diego, CA., USA* Title: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary his	2022 tories
[8]	Evolution Meeting, Cleveland, OH., USA Society of Systematic Biologists (SSB) Ernst Mayr award competition Title: Inferring phylogenetic networks using composite likelihood directly from sequence data	2022
[7]	Louisiana State University, Baton Rouge, LA., USA Department of Biological Sciences Title: Inferring phylogenetic networks using composite likelihood directly from sequence data	2022
[6]	The Korean Association of Biological Sciences, Seoul, South Korea* The Ecological Society of Korea Section Title: Comparative performance of popular methods for hybrid detection using genomic data	2021
[5]	Workshop in Mathematical and Computational Biology* Bioinformatics Section Title: Comparative performance of popular methods for hybrid detection using genomic data	2021
[4]	Misericordia University, Dallas, PA., USA* Biology Seminar Series Title: How my gap year changed my perspectives	2021
[3]	The Stone Laboratory, Gibraltar Island, OH., USA EEOB 1930 Introduction to Biological Studies-Aquatic Biology Title: Phylogenetic networks and behavioral evolution of Primates	2019
[2]	Ewha Womans University, Seoul, South Korea Eco-science/Eco-creative Graduate Seminar Title: On the use of Median-Joining network	2016

[1]	Ewha Womans University, Seoul, South Korea Laboratory of Behavior and Ecology Weekly Seminar Title: The evolution of infanticide and male takeover in primates in a macroevolutionary framework	2013
	egular talks Evolution Meeting* Title: Comparative performance of popular methods for hybrid detection using genomic data	2021
[5]	The Ohio State University, Columbus, OH., USA* Evolution, Ecology, and Organismal Biology (EEOB) Annual Darwin Series Title: Comparative performance of popular methods for hybrid detection using genomic data	2021
[4]	The Ohio State University, Columbus, OH., USA Title: Which tool to use to detect hybridization?	2020
[3]	SSB Standalone Meeting, Gainesville, FL., USA Title: Comparison and evaluation on the accuracy of popular hybrid detection methods using simulated da	2020 ita
[2]	The Ohio State University, Columbus, OH., USA Title: The giving tree: how the branching pattern of a tree is used in evolutionary biology	2019
[1]	Ewha Womans University, Seoul, South Korea Animal Communication Symposium Title: Illustrating hybridization	2017
	Intelligent Systems for Molecular Biology (ISMB), ISCB, Madison, WI., USA Best Poster Award Winner Title: Inference of phylogenetic networks from sequence data using composite likelihood	2022
[4]	Evolution Meeting, Providence, RI., USA Title: Performance and accuracy of Median-Joining Networks and comparisons with Bayesian phylogenies	2019
[3]	The Korean Association of Biological Sciences, Yong-In, South Korea Title: Performance and accuracy of Median-Joining Networks and comparisons with Bayesian phylogenies	2017
[2]	Korean-American Scientists and Engineers Association (KSEA) Young Generation Technical and Leadership Conference (YGTLC), Houston, TX., USA Title: Matrilineal relationships of green pitvipers with the description of a new species of the genus <i>Trime</i> (Squamata: Viperidae: Crotalinae) from the central highlands of Vietnam	2014 eresurus
[1]	University of Toronto, Toronto, ON., Canada Department of Ecology and Evolutionary Biology undergraduate research Fair Title: The evolution of infanticide and male takeover in primates in a macro- evolutionary framework	2012

Academic Experience

Academic visit..... University of Wisconsin-Madison, WI., USA 2022 Wisconsin Institute for Discovery Visiting Ph.D. student Mentor: Prof. Dr. Claudia Solís-Lemus Louisiana State University, Baton Rouge, LA., USA 2022 Department of Biological Sciences Visiting Ph.D. student Mentor: Prof. Dr. Jeremy Brown Research experience..... Ewha Womans University, Seoul, South Korea 2016-2017 Division of Eco-science Researcher Mentor: Prof. Dr. Yikweon Jang Ewha Womans University, Seoul, South Korea 2013 Division of Eco-science Student researcher Mentor: Prof. Dr. Jae Chun Choe University of Toronto, ON., Canada 2011-2013 Work-study student Faculty of Forestry Mentor: Prof. Dr. Sandy Smith and Eric Davies Biodiversity technician 2012 Royal Ontario Museum, Toronto, ON., Canada Student researcher Centre for Biodiversity and Conservation Biology Mentor: Prof. Dr. Robert Murphy University of Toronto, ON., Canada 2011-2012 Department of Ecology and Evolutionary Biology Student researcher Mentor: Prof. Dr. Deborah McLennan 2010 University of Toronto, ON., Canada Cities Centre, Department of Geography Student data collector Fieldwork experience..... o Laos, Indonesia, Mongolia, China, and South Korea 2016-2017 Greater Toronto Area (GTA) 2010-2013 Teaching and Mentoring Experience The Ohio State University. Teaching assistant o EEOB 3310 Evolution (Spring, Fall) 2021 (Spring, Summer, Fall) 2020 (Spring, Fall) 2019 o EEOB 2520 Human Physiology (Summer) 2021 EEOB 1930 Introduction to Biological Studies—Aquatic Biology (Summer) 2019 o BIOL 1113 Energy Transformation and Development (Fall) 2018

University of Toronto	
Teaching assistant o BIO 120 Adaptation and Biodiversity	(Summer) 2015 (Summer) 2014
 BIO 220 From Genomics to Ecosystems in a Changing World EEB 362 Macroevolution EEB 386 Avian Biology 	(Fall) 2013 (Spring) 2015 (Fall) 2014 (Spring) 2014
Miscellaneous	
 Daruma Eco-Farm, Bang Phra, Si Racha District, Chon Buri, Thailand Cheong-Shim International English Camp, Ga-Pyeong, South Korea 	2016 2009
(Co-)supervision of undergraduate students.	
Alanna Kong	2021–2022
Undergraduate student at University of Toronto	
Mentored through University of Toronto Woodsworth Mentorship Program O Devansh Pandey	2021–2022
Undergraduate student at Indian Institute of Technology Kharagpur	
Currently a graduate student at University of Texas at Austin	
Mentored through Científico Latino	0000 0001
 McKenna Molnar Graduate student at The Ohio State University 	2020-2021
EEOB Graduate Mentoring Program, The Ohio State University, OH., USA	
 Shelby Jansens and Kimberly Wiles Co-supervised with Dr. Laura Kubatko 	2020
Mathematical Biosciences Institute Research Experiences for Undergraduates program	
Title: Detecting shifts in the evolutionary process in SARS-CoV-2 genomes	
 Tulio Soares and Ellen Southam 	2014-2015
Co-supervised with Dr. Pedro Bernardo	
University of Toronto and Royal Ontario Museum • Shreeram Senthivasan	2014
Co-supervised with Drs. Pedro Bernardo, Santiago Sánchez-Pacheco, and Robert Murphy	2014
University of Toronto and Royal Ontario Museum	
Conference and Workshop Participation	
*Virtual event	
Participation with a role.	
 Instructor Methodological Advances in Reticulate Evolution, Botany Meeting, Boise, I SSB Mayr Award Abstract Reviewer & SSE Hamilton Award Judge 	
Evolution Meeting, Albuquerque, NM., USA	2023
• Teaching Assistant Workshop on Molecular Evolution, Woods Hole, MA., USA	2023
• Technical Moderator ISMB, ISCB, Madison, WI., USA	2022
 Symposium Organizer (co-organized with Md Rejuan Haque) Evolution Meeting, Cleveland, OH., USA 	2022
Symposium title: Towards the network of life: Phylogenetic networks as a tool to understand	
complex evolutionary histories.	
 Chair/Moderator in multiple Faux-Live Sessions, Evolution Meeting* 	2021

Participant	
 Midwest Machine Learning Symposium, University of Illinois Chicago, IL., USA 	2023
 Workshop in Mathematical and Computational Biology* 	2022
 Annual Conference of the Korean Association of Biological Sciences, South Korea* 	2021
 Workshop in Mathematical and Computational Biology* 	2021
 SMRT Leiden 2021 – Young Investigator Virtual Conference, 	
hosted by Pacific Biosciences and Leiden University Medical Center*	2021
Virtual Asilomar 2021, American Society of Naturalists*	2021
• Future of Systematics Workshop at SSB Standalone Meeting,	2020
funded by NSF, hosted by Dr. Emily Sessa, University of Florida, Gainesville, FL., USA	2020
 Evolution Meeting, Providence, RI., USA Midwest Phylogenetics Workshop, Itasca Biological Station, funded by NSF, 	2019
hosted by Dr. Emma Goldberg, University of Minnesota, MN., USA	2019
 Annual Conference of the Korean Association of Biological Sciences, Yong-In, South Korea 	2019
 Society for Conservation Biology (SCB) Asia Section Workshop on Conservation policy, 	2017
funded by SCB, Bangkok, Thailand	2017
World Congress of Herpetology, Hangzhou and Tonglu, China	2016
 Phylogenomics Symposium and Software School hosted by Dr. Tandy Warnow 	
at SSB Standalone Meeting, University of Michigan, Ann Arbor, MI., USA	2015
Diversity and Inclusion Activities	
Participation with a role	
 Moderator International Mixer, Evolution Meeting* 	2021
 Moderator Decolonizing Evolution Workshop, Evolution Meeting* 	2021
 Moderator Strategies for Responding to Harassment and Bullying: Improving Workplace 	_0_1
Climate, Evolution Community Resources for Early Career Researchers 2020 (ECR ²)*	2020
• Moderator Fireside ECR Chat, ECR ² *	2020
Participant	
 International Mixer, Evolution Meeting, Cleveland, OH., USA 	2022
 Transformative Justice within Academia: A radical institutional reflection, The Centre for 	2022
Criminology and Sociolegal Studies Graduate Student Conference, University of Toronto*	2021
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Grants and Awards	
All in US Dollars unless stated. †Canadian Dollar; ‡Approximately converted from South Kore	an Man
Total amount of funding received up to date \approx US\$50,000	all vvoli
Total amount of familing received up to date 1-00000,000	
Highlights	
 The Presidential Fellowship, The Ohio State University [\$36,500] 	2022
o SSB Ad Hoc Funds [\$3,000]	2021
• SSE Graduate Research Excellence Grant – R.C. Lewontin Award competition [\$1,800]	2020
 University of Toronto Graduate Fellowship [Stipend with tuition waived for 18 months] 	2013-2015
 E.M. Walker Graduate Award in Biodiversity, University of Toronto [†\$2,615] 	2014

Other grants	
 EvolCompGen Best Poster Award, ISMB, ISCB [\$100] 	2022
 EEOB Graduate Development Grant, The Ohio State University [Funded] 	2022
 EEOB Graduate Evolution & Ecology Student Organization (GEES) Career Development 	
Grant, The Ohio State University [\$200]	2022
 Council of Graduate Students (CGS) Career Development Grant, 	
The Ohio State University [\$350]	2022
 EEOB Darwin Talk Society Membership Grant, The Ohio State University [\$70] 	2021
 EEOB Graduate Development Grant, The Ohio State University [Funded] 	2021
 Funding for participation in Future of Systematics Workshop, 	
SSB Standalone Meeting (NSF) [\$500]	2020
 Funding for participation in Midwest Phylogenetics Workshop (NSF) [Funded] 	2019
 EEOB Graduate Development Grant, The Ohio State University [Funded] 	2019
o Major contribution to successful grant application to National Research Foundation of Korea	a
PI: Dr. Yikweon Jang, Ewha Womans University, Seoul, South Korea [‡\$500,000]	2017
 University of Toronto Undergraduate Bursaries [†≈\$3,000] 	2010-2012

Outreach and Service

• Scientist Junior science café, Morgridge Institute for Research, WI., USA	2023
 Awardee Graduate school awards ceremony, The Ohio State University 	2022
 Invited Panelist EEOB 8894: EEOB Graduate eeminar, The Ohio State University 	2020
 Invited Guest Translational Data Analytics Institute kickoff event, 	
College of Arts and Sciences, The Ohio State University	2020
 Volunteer Museum of Biological Diversity's open house, The Ohio State University 	2019
 Graduate studies Committee Department of EEOB, The Ohio State University 	2020-2021
 Admissions Committee Department of EEOB, The Ohio State University 	2019-2020
o Communication Officer Society for Conservation Biology (SCB), South Korean Chapter	2016-2017
o Volunteer Biologist Kuang Si Butterfly Park, Ban Thapene, Luang Prabang District, Laos	2016, 2022

Peer-Review Activities

Systematic Biology; Molecular Biology and Evolution; Genome Biology and Evolution; Scientific Reports;
 Molecular Phylogenetics and Evolution; Infection, Genetics and Evolution; F1000Research

Professional Memberships

- Society of Systematic Biologists
- Society for Study of Evolution

Skills

Programming UNIX, R, Python, Julia, HTML, JavaScript Typesetting Languages English (Fluent), Korean (Native), Japanese (Intermediate)

References

[1] Prof. Dr. Laura S. Kubatko (Ph.D. advisor)

Department of Statistics and
Department of Evolution, Ecology, and Organismal Biology
The Ohio State University
219 Cockins Hall, Columbus, OH., 43210, USA
Ikubatko@stat.osu.edu
+1 614-247-8846

[2] Prof. Dr. Claudia Solís-Lemus (Postdoc advisor)

Wisconsin Institute for Discovery Department of Plant Pathology University of Wisconsin-Madison, 330 N. Orchard St. Madison, WI., 53715, USA solislemus@wisc.edu +1 608-316-4568

[3] Prof. Dr. Robert W. Murphy (M.Sc. advisor)

Reptilia Sanctuary and Education Centre and Department of Natural History-Royal Ontario Museum and Professor of Ecology and Evolutionary Biology University of Toronto 100 Queen's Park Toronto, ON., M3S 2C6, Canada bob.murphy.ca@gmail.com +1 416-721-8829

[4] Prof. Dr. Bryan C. Carstens

Department of Evolution, Ecology, and Organismal Biology And Tetrapod Division, Museum of Biological Diversity The Ohio State University, 318 W. 12th Avenue, Columbus, OH., 43210, USA carstens.12@osu.edu +1 614-292-6587

[5] Prof. Dr. Jeremy M. Brown

Department of Biological Sciences Louisiana State University A243 Life Science Annex, Baton Rouge, LA., 70803, USA jembrown@lsu.edu +1 225-578-1745