Sungsik Kong

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Madison, WI. 53715 USA

Summary

• I am a *computational evolutionary biologist* with training in biology, statistics, computer science, and data science.

- 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

Brown University, Providence, Rhode Island, USA

Scheduled in Fall 2024

Institute for Computational and Experimental Research in Mathematics (ICERM)

University of Wisconsin-Madison, Madison, Wisconsin, USA

2023-present

Postdoctoral fellow

Wisconsin Institute for Discovery Postdoctoral research associate

Mentor: Dr. Claudia Solís-Lemus

EDUCATION

The Ohio State University, Columbus, Ohio, USA

2018-2022

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

Presidential fellow

2022

<u>Dissertation</u>: Towards the network of life: Phylogenetic networks as a tool to understand complex

evolutionary histories Advisor: Dr. Laura Kubatko

University of Toronto, Toronto, Ontatio, Canada

2013-2015

M.Sc. in Ecology and Evolutionary Biology

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

Advisor: Dr. Robert Murphy

University of Toronto, Toronto, Ontatio, Canada

2006-2012

B.Sc. in Zoology and Ecology and Evolutionary Biology

Undergraduate thesis advisors: 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 histo-compatibility 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

- [1] **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
- [2] 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

[1]	ICERM, Brown University, Providence, RI., USA	Scheduled in 2024
[2]	Vietnam Academy of Science and Technology, Hanoi, Vietnam	2024
[3]	Sungshin Women's University, Seoul, South Korea	2024
[4]	Ewha Womans University, Seoul, South Korea	2024
[5]	The International Society for Computational Biology (ISCB), Society for Molecular Biology and Evolution (SMBE)* $EvolCompGen\ we binar\ series$	2023
[6]	Society for Industrial and Applied Mathematics, New York-New Jersey-Pennsylvania Section (SIAM-NNP), New Jersey Institute of Technology (NJIT), Newark, NJ., USA Mathematics of Evolution Minisymposium	2023
[7]	University of Wisconsin-Madison, WI., USA [video] UW-Madison Fall 2023 Evolution Seminar Series	2023
[8]	University of Wisconsin-Madison, WI., USA UW-Madison Postdoctoral Research Symposium Blitz Talks Competition	2023
[9]	Taming the BEAST, Squamish, BC., Canada Squamish BEAST Tamers	2023
10]	Botany Meeting, Boise, ID., USA Seeing the Network for the Trees Symposium	2023
11]	Algorithms and Complexity in Phylogenetics * $[{\rm video}]$	2022
12]	Indiana University, Bloomington, IN., USA	2022
13]	University of California San Diego, CA., USA*	2022
14]	Evolution Meeting, Cleveland, OH., USA Society of Systematic Biologists (SSB) Ernst Mayr Award Competition	2022
15]	Louisiana State University, Baton Rouge, LA., USA Department of Biological Sciences Seminar	2022
16]	The Korean Association of Biological Sciences, Seoul, South Korea* The Ecological Society of Korea Section	2021
17]	Workshop in Mathematical and Computational Biology* [video]	2021

[18]	Misericordia University, Dallas, PA., USA* Biology Seminar Series	2021
[19]	The Stone Laboratory, Gibraltar Island, OH., USA EEOB 1930 Introduction to Biological Studies-Aquatic Biology	2019
[20]	Ewha Womans University, Seoul, South Korea Eco-science/Eco-creative Graduate Seminar	2016
[21]	Ewha Womans University, Seoul, South Korea Laboratory of Behavior and Ecology Weekly Seminar	2013
Reg	ular talks	
[1]	University of Wisconsin-Madison, WI., USA Wisconsin Institute for Discovery Symposium	2023
[2]	Evolution Meeting*	2021
[3]	The Ohio State University, Columbus, OH., USA* Evolution, Ecology, and Organismal Biology (EEOB) Annual Darwin	2021 Series
[4]	The Ohio State University, Columbus, OH., USA Evolution & Ecology Club	2019, 2020
[5]	SSB Standalone Meeting, Gainesville, FL., USA	2020
[6]	Ewha Womans University, Seoul, South Korea Animal Communication Symposium	2017
Post	er presentations	
[1]	Intelligent Systems for Molecular Biology (ISMB), ISCB, Madison, W $Best\ Poster\ Award\ Winner$	I., USA 2022
[2]	Evolution Meeting, Providence, RI., USA	2019
[3]	The Korean Association of Biological Sciences, Yong-In, South Korea	2017
[4]	Korean-American Scientists and Engineers Association (KSEA), Young Generation Technical and Leadership Conference (YGTLC), H	ouston, TX., USA 2014
[5]	University of Toronto, Toronto, ON., Canada Department of Ecology and Evolutionary Biology undergraduate resear	2012 rch Fair
Acad	demic visit	
[1]	University of Wisconsin–Madison, WI., USA Wisconsin Institute for Discovery Mentor: Dr. Claudia Solís-Lemus	2022 Visiting Ph.D. student
[2]	Louisiana State University, Baton Rouge, LA., USA Department of Biological Sciences Mentor: Dr. Jeremy Brown	2022 Visiting Ph.D. student
Rese	earch experience	
[1]	Ewha Womans University, Seoul, South Korea Division of Eco-science Mentors: Drs. Jae Chun Choe and Yikweon Jang	2013, 2016–2017 Researcher
[2]	University of Toronto, ON., Canada	2011-2013
	Faculty of Forestry	Work-study student &
	Mentors: Dr. Sandy Smith and Eric Davies	Biodiversity technician

ACADEMIC EXPERIENCE

[3] Royal Ontario Museum, Toronto, ON., Canada Centre for Biodiversity and Conservation Biology	$\begin{array}{c} 2012 \\ Student \ researcher \end{array}$
Mentor: Dr. Robert Murphy	
[4] University of Toronto, ON., Canada Department of Ecology and Evolutionary Biology Mentor: Dr. Deborah McLennan	2011–2012 Student researcher
[5] University of Toronto, ON., Canada Cities Centre, Department of Geography Mentor: Dr. Kristian Larsen	2010 Student data collector
Fieldwork experience	
[1] Laos, Indonesia, Mongolia, China, and South Korea	2016-2017
[2] Indonesia, Laos, and South Korea	2016
[3] Greater Toronto Area (GTA)	2010–2013
International workshops	
Instructor	
[1] Methodological Advances in Reticulate Evolution, Botany Meeti	
[2] Squamish BEAST Tamers, Taming the BEAST, Squamish, BC.,	Canada 2023
Teaching assistant (†Lead teaching assistant) [1] Workshop on Molecular Evolution, Woods Hole, MA., USA†	Scheduled in 2024
[2] Workshop on Molecular Evolution, Woods Hole, MA., USA	2023
The Ohio State University	
Teaching assistant	
[1] EEOB 3310 Evolution	(Spring, Fall) 2021
	(Spring, Summer, Fall) 2020 (Spring, Fall) 2019
[2] EEOB 2520 Human Physiology	(Summer) 2021
[3] EEOB 2320 Intiman I hysiology [3] EEOB 1930 Introduction to Biological Studies-Aquatic Biology	(Summer) 2021 (Summer) 2019
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[4] BIOL 1113 Energy Transformation and Development	(Fall) 2018
University of Toronto	
Teaching assistant [1] BIO 120 Adaptation and Biodiversity	(Summer) 2015 (Summer) 2014
	(Fall) 2013
[2] BIO 220 From Genomics to Ecosystems in a Changing World	(Spring) 2015
[3] EEB 362 Macroevolution	(Fall) 2014
[4] EEB 386 Avian Biology	(Spring) 2014

TEACHING AND MENTORING EXPERIENCE

(Co-)supervision of undergraduate and graduate students		
[1] Alanna Kong (University of Toronto) Mentored through University of Toronto Woodsworth Mentorship Program	2021-2022	
[2] Devansh Pandey (Indian Institute of Technology Kharagpur) Mentored through Científico Latino Currently a graduate student at University of Texas at Austin	2021–2022	
[3] McKenna Molnar (The Ohio State University) Mentored through OSU EEOB Graduate Mentoring Program	2020-2021	
[4] Shelby Jansens and Kimberly Wiles Co-supervised with Dr. Laura Kubatko through Mathematical Biosciences Institute Research Experiences for Undergraduates prog Project title: Detecting shifts in the evolutionary process in SARS-CoV-2 genome		
[5] Tulio Soares and Ellen Southam Co-supervised with Dr. Pedro Bernardo at University of Toronto and Royal Ontario Museum	2014-2015	
[6] Shreeram Senthivasan Co-supervised with Drs. Pedro Bernardo, Santiago Sánchez-Pacheco, and Robert . University of Toronto and Royal Ontario Museum	2014 Murphy at	
Miscellaneous		
[1] Daruma Eco-Farm, Bang Phra, Si Racha District, Chon Buri, Thailand	2016	
[2] Cheong-Shim International School English Camp, Ga-Pyeong, South Korea	2009	
* Virtual event		
Participation with a role		
[1] Evolution Meeting, Albuquerque, NM., USA SSB Mayr Award Abstract Reviewer & Society of Study of Evolution (SSE) Ham Judge	2023 ilton Award	
[2] ISMB, ISCB, Madison, WI., USA Technical Moderator	2022	
[3] Evolution Meeting, Cleveland, OH., USA SSB Symposium Co-organizer (with Dr. Md Rejuan Haque) Symposium title: Towards the network of life: Phylogenetic networks as a tool to underst complex evolutionary histories.	2022 tand	
[4] Evolution Meeting* Chair/Moderator in multiple Faux-Live Sessions	2021	
Participant		
[1] Wisconsin Institute for Discovery Symposium, University of Wisconsin-Madison, WI., USA	2022, 2023	
[2] Midwest Machine Learning Symposium, University of Illinois Chicago, IL., USA	2023	
[3] Workshop in Mathematical and Computational Biology*	2022	
[4] Annual Conference of the Korean Association of Biological Sciences, South Korea	* 2021	
[5] iEvoBio (Informatics for Phylogenetics, Evolution and Biodiversity), Evolution Me	eeting* 2021	
[6] Workshop in Mathematical and Computational Biology*	2021	

Conference and *

WORKSHOP PARTICIPATION

[7]	SMRT Leiden 2021 – Young Investigator Virtual Conference*	2021
[8]	Virtual Asilomar 2021, American Society of Naturalists*	2021
[9]	Future of Systematics Workshop at SSB Standalone Meeting, University of Florida, Gainesville, FL., USA	2020
[10]	SSB Standalone Meeting, Gainesville, FL., USA	2020
[11]	Evolution Meeting, Providence, RI., USA	2019
[12]	Midwest Phylogenetics Workshop, Itasca Biological Station, University of Minnesota, MN., USA	2019
[13]	Annual Conference of the Korean Association of Biological Sciences, Yong-In, South Korea	2017
[14]	Society for Conservation Biology (SCB) Asia Section, Workshop on Conservation policy, Bangkok, Thailand	2017
[15]	World Congress of Herpetology, Hangzhou and Tonglu, China	2016
[16]	Phylogenomics Symposium and Software School at SSB Standalone Meeting, University of Michigan, Ann Arbor, MI., USA	2015
	uS Dollars unless stated. †Canadian Dollar; ‡Converted from South Korean Won amount of funding received up to date $\approx\!$ US\$50,000	
High	alights	
[1]	The Presidential Fellowship, The Ohio State University [\$36,500]	2022
[2]	SSB Ad Hoc Funds [\$3,000]	2021
[3]	SSE Graduate Research Excellence Grant [\$1,800] R.C. Lewontin Award competition	2020
[4]	University of Toronto Graduate Fellowship	2013 – 2015
[5]	E.M. Walker Graduate Award in Biodiversity, University of Toronto $[\$2,\!615\dagger]$	2014
Othe	er grants	
[1]	EvolCompGen Best Poster Award, ISMB, ISCB [\$100]	2022
[2]	EEOB Graduate Development Grant, The Ohio State University [Funded]	2022
[3]	EEOB Graduate Evolution & Ecology Student Organization (GEES) Career Development Grant, The Ohio State University [\$200]	2022
[4]	Council of Graduate Students (CGS) Career Development Grant, The Ohio State University [\$350]	2022
[5]	EEOB Darwin Talk Society Membership Grant, The Ohio State University [\$70]	2021
[6]	EEOB Graduate Development Grant, The Ohio State University [Funded]	2021
[7]	Funding for participation in Future of Systematics Workshop, SSB Standalone Meeting (NSF) [\$500]	2020
[8]	Funding for participation in Midwest Phylogenetics Workshop (NSF) [Funded]	2019
[9]	EEOB Graduate Development Grant, The Ohio State University [Funded]	2019
[10]	University of Toronto Undergraduate Bursaries [†≈\$3,000]	2010-2012

Grants and Awards

DIVERSITY AND INCLUSION ACTIVITIES	Participation with a role			
	[1] International Mixer, Evolution Meeting* $Moderator$	2021		
	[2] Decolonizing Evolution Workshop, Evolution Meeting* Moderator	2021		
	[3] Strategies for Responding to Harassment and Bullying: Improving Workplace Climate, Evolution Community Resources for Early Career Researchers 2020 (ECR ²)* Moderator	2020		
	[4] Fireside ECR Chat, ECR ^{2*} Moderator	2020		
	Participant			
	[1] International Mixer, Evolution Meeting, Cleveland, OH., USA	2022		
	[2] Transformative Justice within Academia: A radical institutional reflection, The Centre for Criminology and Sociolegal Studies Graduate Student Conference, University of Toronto*	2021		
OUTREACH AND SERVICE	[1] Junior science café, Morgridge Institute for Research, WI., USA Scientist	2023		
	[2] EEOB 8894: EEOB Graduate seminar, The Ohio State University Invited Panelist	2020		
	[3] Museum of Biological Diversity's open house, The Ohio State University $Volunteer$	2019		
	[4] Department of EEOB, The Ohio State University Graduate studies Committee	2020-2021		
	[5] Department of EEOB, The Ohio State University Admissions Committee	2019–2020		
	[6] SCB, South Korean Chapter Communication Officer	2016–2017		
	[7] Kuang Si Butterfly Park, Ban Thapene, Luang Prabang District, Laos Volunteer Biologist	2016, 2022		
PEER-REVIEW ACTIVITIES	Review Editor on the Editorial Board of Evolutionary Systems Biology (specialty section of Frontiers in Systems Biology). Reviewer at Systematic Biology; Molecular Biology and Evolution; Genome Biology and Evolution; Scientific Reports; Molecular Phylogenetics and Evolution; Infection, Genetics and Evolution; PLOS Computational Biology; F1000Research; Journal of Mathematical Biology; Bulletin of Mathematical Biology; Ecology and Evolution			
ACTIVE PROFESSIONAL MEMBERSHIPS	Society of Systematic Biologists; Society for Study of Evolution; International Society tational Biology	ty for Compu-		
SKILLS	Programming: UNIX, R, Python, Julia, HTML, JavaScript Typesetting: LATEX, R Markdown, Jupyter Notebook Languages: English (Fluent), Korean (Native), Japanese (Intermediate)			

References

- Dr. Laura S. Kubatko (Ph.D. advisor)
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 Department of Evolution, Ecology, and Organismal Biology
 The Ohio State University
 219 Cockins Hall, Columbus, OH., 43210, USA
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- [2] Dr. Claudia Solís-Lemus (Postdoc advisor)
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 Department of Plant Pathology
 University of Wisconsin-Madison,
 330 N. Orchard St.
 Madison, WI., 53715, USA
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- [3] 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
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