

Gerardo Antonio Martín Muñoz de Cote

PhD., MSc. Biol. Cons., MVZ. — SNI I

Curriculumvitæ

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Born: 2 March 1981—Oxford, England
Nationality: Mexicano

2^a Privada Mapimí 610, Colonia Hipó-

Education

- 2012-2017 PhD College of Public Health, Medical and Veterinary Sciences, James Cook University. Thesis: **Modelling Hendra virus transmission from flying foxes to horses.**
- 2007-2010 MSc in Conservation Biology, Instituto de Ecología A.C. Thesis: **A model of leptospirosis and comparison of its frequency between two sites in the Perote ground squirrel (*Spermophilus perotensis*), and two domestic species.**
- 2001-2006 BSc in Veterinary Medicine and Zootechnics, Universidad de LaSalle Bajío.
- 2000-2001 1st year Computer Science, Facultad de Matemáticas, Universidad de Guanajuato.

Areas of specialisation

Infectious disease ecology • Public Health • Infectious disease modelling in wild animals • Ecological niche modelling • Spatial statistics • Geographic information systems • Conservation biology

Professional experience

- 2021- Associate Lecturer, Escuela Nacional de Estudios Superiores unidad Mérida, Universidad Nacional Autónoma de México.
- 2020 Pathology and Statistics Lecturer. Bachelor of Veterinary Sciences, Faculty of Veterinary Medicine and Zootechnics, Universidad Juárez del Estado de Durango. Durango, DGO. MX.
- 2018-2020 Research associate. Ecological Health Research Group ([Murray Lab¹](http://murraylab.weebly.com/)), Department of Infectious Disease Epidemiology, Faculty of Medicine, Imperial College London at St. Mary's.
- 2017 External consultant. Project: “Modeling Spillover”(Defense Advanced Research Projects Agency, DARPA; D16AP00113), Bozeman Disease Ecology Lab, Montana State University.
- 2012-2016 PhD student.
- 2011-2012 Occasional field assistance for Dr. Martín Pereda, Universidad Juárez del Estado de Durango, Durango, DGO.
- 2007 Private veterinary practice in small pet species.
- 2006 Durrell Wildlife Conservation Trust, Jersey Zoo, Jersey, Channel Islands. Student placement. M.Sc. Javier López, head the Veterinary department. Research project: “A pilot study on the anaesthetic effects of the combination of Ketamine – medetomidine, and propofol in the anuran *Polypedates leucomystax*”.
- 2006 Animal Pathology Laboratory, Regional Cattle Union, León, Guanajuato, Mex. D.V.M. Manuel Conrado González, head of the Pathology Laboratory. 600 h of professional social service.

¹<http://murraylab.weebly.com/>

Grants, honors & awards

- 2022-2023 Research project PAPIIT IA200822 “Geostatistical estimation of ecological niches and applications in ecology, public health and conservation”.
- 2012-2016 Reseach grant of the National Hendra Virus Research Program, Australia. RIRDC PRJ-008213.
- 2010 *Bernardo Villa* award in the 1st Latin-American Congress of Mammalogy. First prize for academic excellence in the category MSc best thesis.

Publications & talks

JOURNAL ARTICLES

- 2023 Eyal Goldstein, Joseph J. Erinjery, **Gerardo Martín**, H. Janaka de Silva, Peter J. Diggle, David G. Lalloo, Kris A. Murray & Takuya Iwamura. Climate change maladaptation for health: Agricultural practice against shifting seasonal precipitation affects snakebite risk for rural farmers in the tropics. *iScience*. ISSN: 2589-0042 <https://doi.org/10.1016/j.isci.2023.105946>.
- 2020 José María Gutiérrez, Juliette Borri, Tamara Giles-Vernick, Romain Duda, Abdurazaq Habib, Anita Malhotra, **Gerardo Martín**, Anna F. V. Pintor, Julien Potet, Terrence Scott, Isabelle Bolon, & Rafael Ruiz Catañeda. Understanding and tackling snakebite envenoming with transdisciplinary research. *PLoS Neglected Tropical Diseases*. ISSN: 1935-2735. <https://doi.org/10.1371/journal.pntd.0010897>.
- 2022 **Gerardo Martín**, Joseph J. Erinjery, Dileepa Ediriweera, David G. Lalloo, H. Janaka de Silva, Takuya Iwamura & Kris A. Murray. A mechanistic model of snakebite as a zoonosis: envenoming incidence is driven by snake ecology, socioeconomics and its impacts on snakes. *PLoS Neglected Tropical Diseases*. ISSN: 1935-2735. <http://dx.doi.org/10.1371/journal.pntd.0009867>.
- 2022 **Gerardo Martín**, Carlos Yáñez Arenas & Xavier Chiappa Carrara. Discrepancies between point process models and environmental envelopes identify the niche centroid-geography configuration. *Ecological Modelling*. ISSN: 0304-3800. <https://doi.org/10.1016/j.ecolmodel.2022.109974>.
- 2021 **Gerardo Marín**, Joseph Erinjery, Rikki Gumbs, Ruchira Somaweera, Dileepa Ediriweera, Peter J. Diggle, Anuradhani Kasturiratne, Janaka de Silva, David G. Lalloo, Takuya Iwamura & Kris A. Murray. Integrating snake distribution, abundance and

expert-derived behavioural traits predicts snakebite risk. *Journal of Applied Ecology*, *En-prensa*.

- 2021 **Gerardo Marín**, Joseph Erinjery, Dileepa Ediriweera, David G. Lalloo, Takuya Iwamura & Kris A. Murray. Redefining snakebite as a zoonosis: disease incidence is driven by snake ecology, socioeconomics and anthropogenic impacts. *MedRxiv*. <https://doi.org/10.1101/2021.10.01.21264438>.
- 2021 **Gerardo Martín**, Carlos Yáñez-Arenas, Rodrigo S. Camacho, Eyal Goldstein, Takuya Iwamura, Kris A. Murray & Xavier Chiappa-Carrara. Effects of global environmental change on the burden of snakebite. *ToxiconX*.
- 2021 Eyal Goldstein, Joseph Erinjery, **Gerardo, Martín**; Anuradhani Kasturiratne, Dileepa Ediriweera, Janaka de Silva, Peter J. Diggle, Peter, David G. Lalloo, Kris A. Murray, & Takuya Iwamura. **Integrating human behavior and snake ecology with agent-based models to predict snakebite in high risk landscapes**. *PLoS Neglected Tropical Diseases*.
- 2020 Carlos Yáñez-Arenas, **Gerardo Martín**, Luis Osorio-Olvera, Jazmín Escobar-Luján, Sandra Castaño-Quintero & Enrique Martínez-Meyer. **The niche centrality hypothesis: key points about unfilled niches and the potential use of supraspecific modeling units**. *Biodiversity Informatics-en prensa*.
- 2020 **Gerardo Martín**, Mario Espinoza, Michelle Heupel, & Colin Simpfendorfer (2020). **Estimating marine protected area network benefits for reef sharks**. *Journal of Applied Ecology*. eISSN: 1365-2664. <https://doi.org/10.1111/1365-2664.13706>.
- 2019 Kris Murray, **Gerardo Martín** & Takuya Iwamura (2019). **Focus on snake ecology to fight snakebite**. *The Lancet*. (19) 325. ISSN: 01406736. [https://doi.org/10.1016/S0140-6736\(19\)32510-3](https://doi.org/10.1016/S0140-6736(19)32510-3)
- 2018 **Martín, Gerardo**; Becker, Daniel; Washburn, Alex & Raina K. Plowright. **Environmental persistence of influenza H5N1 is driven by temperature and salinity: insights from a Bayesian meta-analysis**. *Frontiers in Ecology and Evolution*.
- 2018 Brannelly, Laura A.; **Martín, Gerardo**; Lewellyn, John; Skerratt, Lee & Lee Berger. **Size dependant susceptibility to chytridiomycosis in the invasive *Rhinella marina***. *Diseases of Aquatic Organisms*.

2018

- Martín, Gerardo;** Yáñez-Arenas, Carlos; Plowright, Raina K.; Carla Chen & Skerratt, Lee. **Hendra virus spillover is a bimodal system driven by climatic factors.** *EcoHealth*.
- 2018 **Martín, Gerardo;** Yáñez-Arenas, Carlos; Plowright, Raina K.; Carla Chen & Skerratt, Lee. **Climate change could increase the extent of areas at risk of Hendra virus spillover.** *EcoHealth*.
- 2017 Yáñez Arenas, Carlos Alberto; Rioja-Nieto, Rodolfo; Dzul-Manzanilla, Felipe; **Martín, Gerardo;** Chiappa-Carrara, Xavier; Buenfil-Ávila, Aura; Manrique-Saide, Pablo, Correa-Morales, Fabián; Díaz-Quiñónez, José Alberto; Pérez-Rentería, Crescencio; Ordoñez-Álvarez, José & Herón Huerta. **Characterization of environmental suitability for the Asian tiger mosquito (*Aedes albopictus*) in México.** *Journal of Medical Entomology*.
- 2017 **Martín, Gerardo;** Webb, Rebecca J.; Plowright, Raina K.; Chen, Carla & Lee F. Skerratt. **Microclimates might limit indirect spillover of the bat borne zoonotic Hendra virus.** *Microbial ecology*.
- 2016 **Martín, Gerardo;** Skerratt, Lee; Yáñez-Arenas, Carlos; Plowright, Raina K. & Carla Chen. **Climatic suitability influences species specific abundance patterns of Australian flying foxes and risk of Hendra virus spillover.** *One Health Journal*.
- 2016 Alison J. Peel, Hume E. Field, Peter A. Reid, Raina K. Plowright, Christopher C. Broder, Lee F. Skerratt, David T. S. Hayman, Olivier Restif, Melanie Taylor, **Gerardo Martín,** Gary Crameri, Ina Smith, Michelle Baker, Glenn A. Marsh, Jennifer Barr, Andrew C. Breed, James L. N. Wood, Navneet Dhand, Jenny-Ann Toribio, Andrew A. Cunningham, Ian Fulton, Wayne L. Bryden, Cristy Secombe, Lin-Fa Wang, **The equine Hendra virus vaccine remains a highly effective preventative measure against infection in horses and humans: ‘The imperative to develop a human vaccine for the Hendra virus in Australia’** *Infection Ecology and Epidemiology*. 6:31658.
- 2015 **Martín, Gerardo;** Plowright, Raina K.; Chen, Carla; Kault, David; Selleck, Paul & Lee F. Skerratt. 2015. **Hendra virus survival does not explain the pattern of transmission and implicates relatively direct transmission routes.** *Journal of General Virology*.
- 2015 Plowright, Raina; Eby, Peggy; Hudson, Peter; Smith, Ina; Westcott, David; Bryden, Wayne; Middleton, Deborah; Reid, Peter; McFarlane, Rosemary; **Martín, Gerardo;** Tabor, Gary; Skerratt, Lee; Anderson, Dale; Crameri, Gary; Quammen,

David; Jordan, David; Freeman, Paul; Wang, Lin-Fa; Epstein, Jonathan; Marsh, Glenn; Kung, Nina & Hamish McCallum. 2015. **Ecological Dynamics of Emerging Bat Virus Spillover**. *Proceedings of the Royal Society B*.

2013 Valdez-Lares, Rosaura; **Martín-Muñoz de Cote, Gerardo A.**; Muñiz-Martínez, Raúl & Georgina Santos-Barrera. **New distributional records for amphibians from Durango, México**. *Herpetological Review*. 44 (4): 646-649.

In-review

2021 **Martín, Gerardo**; Carlos Yáñez-Arenas & Xavier Chiappa-Carrara. **Discrepancies between PPMs and MVEs identify the niche centroid - geography configuration**. *Ecological Modelling*.

Ongoing projects

2019 Martín, Gerardo & Kris Murray. **Redefining snakebites as a zoonotic disease: implications for global change forecasting**.

2019 Martín, Gerardo & Kris Murray. **Potential abundance of Sri Lankan venomous species**.

2019 Martín, Gerardo & Kris Murray. **Predicting the impacts of global change on snakebite burden**.

2018 Martín, Gerardo; Webb, Rebecca J.; Plowright, Raina K.; Chen, Carla & Lee F. Skerratt. **Tree cover in paddocks is the main determinant of exposure to Hendra virus in horses**.

2018 Kosch, Tiffany & Gerardo Martín. **Modelling the prevalence of amphibian chytridiomycosis in Peru**.

2018 Martín, Gerardo; Giles, John R.; Westcott, David; Parry, Hazel; Plowright, Raina; Chen, Carla & Lee F. Skerratt. **Landscape level mechanisms driving risk of Hendra virus spillover**.

NEWSPAPER ARTICLES

- 2013 Luly, Jon; Martín, Gerardo; Skerratt, Lee. 30 April 2013. **Breaking up bat colonies doesn't eliminate health risks.** *The Conversation* ²

TALKS & POSTER PRESENTATION

- 2022 Congress of Production and Animal Health Sciences, Faculty of Veterinary Medicine and Zootechnics, UNAM, Mexico City. *Ophidism and the ecology of zoonosis in light of global change*, keynote speech.
- 2022 Mexican Scientific Congress of Ecology, Oaxaca, Oax.
1. Oral presentation: **Identifying the geographic-environmental configuration of ecological niches**
 2. Poster: **Ophidism as a dynamic process during global change**
 3. Poster: **Agent based models to optimise reef shark protection in marine network protected areas**
- 2020 Institutional Seminar, Escuela Nacional de Estudios Superiores unidad Mérida. **Quantitative bridges between medicine and ecology.**
- 2019 Association for Tropical Biology and Conservation, Asia-Pacific Chapter, Thulhiriya, Sri Lanka. **Abundance of venomous snakes of Sri Lanka in relation to climate and land cover.**
- 2019 MRC winter seminar series, Imperial College London at St. Mary's. **The ecology of snakebite.**
- 2017 Institutional seminar, Universidad de Guanajuato. **Ecology of infectious diseases: A chymera of biology?.**
- 2017 Wildlife disease association 2017 International Conference, San Cristóbal de las Casa, Chiapas, Mex. **Niche modelling studies on Hendra virus spillover ecology.** Talk.
- 2017 Mathematics Colloquium Seminar, CIMAT, A. C. **Quantitative techniques to study the ecology of disease spillover.**

²<http://theconversation.com/breaking-up-bat-colonies-doesnt-eliminate-health-risks-13580>

- 2016 One Health Symposium. Division of Tropical Health and Medicine, College of Public Health, Medical and Veterinary Sciences, James Cook University. **Models that predict the risk of Hendra virus transmission from flying foxes to horses.** Talk.
- 2016 CBMDT and CBTID, College of Public Health, Medical and Veterinary Sciences Fitzroy island retreat. **Models of Hendra virus survival to infer transmission pathways from bats to horses.** Talk.
- 2016 CBMDT and CBTID, College of Public Health, Medical and Veterinary Sciences Fitzroy island retreat. **Models that predict risk of Hendra virus transmission from flying foxes to horses.** Poster.
- 2015 Wildlife Disease Association 2015 International Conference, Maroochydore, QLD, Australia. **Understanding frequency of contact between horses and Hendra virus.** Poster.
- 2014 Australasian Bat Society 2014 Conference. Townsville, QLD, Australia. **Hendra virus risk of spillover: The effect of weather and climate.** Talk.
- 2013 Wildlife Diseases Association Australasian section 2013 Conference. Grampians, VIC, Australia. **Contribution of climate and weather to the distribution of Hendra virus spillover events.** Talk.
- 2010 10th National Congress of Mammalogy and 1st Latinamerican Congress of Mammalogy, Guanajuato, Gto., Mexico. **A model of leptospirosis and the comparisson of its frequency between two sites in the Perote ground squirrel (*Xerospermophilus perotensis*) and two domestic species (*Capra hircus* and *Canis falimiaris*).** Talk.
- 2009 1st National Congress of Infectious Disease Ecology and Conservation Medicine , Veracruz, Ver., Mexico. **A model of leptospirosis and the comparisson of its frequency between two sites in the Perote ground squirrel (*Spermophilus perotensis*) and two domestic species.** Talk.

Continuous education

- 2022 Formative evaluations for today's education. CUAIEED, UNAM.
- 2018

Workshop. Software carpentry workshop: GIT and Linux shell. Imperial College London. South Kensington.

2015 Workshop. Advanced techniques in data analysis with R. James Cook University, Townsville, QLD, AU. Lecturer: Murray Logan.

2014 2nd thematic schools “Ecology, Evolution and Control of Infectious Diseases”. Laboratory of Excellence CEBA, Mérida, Yucatán. Lecturer: Dr. Jean Francois Guégan.

General skills

- Vehicle driving
 - Manual and automatic
 - Wheel on left and right hand sides (Australian driver’s licence type “O” from Queensland)
 - Small load vehicles
 - Moderate experience with 4WD vehicles
- Office: Libre/Open Office, MS Office, T_EXstudio
- Geographic information systems: R, Quantum GIS, SAGA
- Scientific writing
- Statistics with R: Spatial statistics, linear and non-linear regression, generalised linear models, generalised additive models, ecological niche modelling methods (Maxent, log-Gaussian fields, boosted regression trees, Poisson point process models), hypothesis tests.
- MCMC sampling for Bayesian statistics with JAGS (similar to WinBUGS and OpenBUGS)
- Field work
 - Small mammal trapping
 - Camera trap sampling
 - Animal tracking with GPS and radio emitters (limited experience)
- Modelling and systems thinking with Stella
- Image processing: The GIMP, Darktable

- Programming languages (in exponentially decreasing order of experience):
 - R, \LaTeX , Python, Maxima
- Image design and drawing: Inkscape, The GIMP
- Linux for general purpose use, mainly Ubuntu and Debian based distributions

Languages

SPANISH. Mother tongue

ENGLISH. Read, write and speak. IELTS score 7.0 (2010).

Other interests

- I've been playing classical guitar since 1998, although my first real lesson was in 2000 with Juan Márquez and then with the great guitarist Juan Carlos Laguna.
- Wildlife photography
- Swimming
- Experimenting and trying linux distributions

Professional references

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 James Cook University
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 Departamento de Biología y Conservación de Vertebrados
 Instituto de Ecología A. C.
 Xalapa, Veracruz, México.
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Dr. Gerardo Suzán Azpiri
Facultad de Medicina Veterinaria y Zootecnia
Departamento de Etología, Animales silvestres y de Laboratorio
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