

Jesús Alfonso Ballesteros

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APPOINTMENTS

2017-present Michael Guyer postdoctoral fellow, Department of Integrative Biology, University of Wisconsin-Madison, Madison, WI, United States

EDUCATION

- 2010-2017** Ph. D. The George Washington University, Washington, DC, United States
Advisor: Gustavo Hormiga
Thesis: Species delimitation of the orchard-spider *Leucauge venusta* (Araneae, Tetragnathidae), the phylogeny of *Leucauge* and the identification of orthologous genes from transcriptomes
- 2006-2010** M. Sc. (Biology) Universidad Nacional Autónoma de México (UNAM), Mexico City, Mexico.
Advisor: Oscar F. Francke
Thesis: Phylogenetic systematics of *Paraphrynus* (Amblypygi, Arachnida)
- 2002-2006** B. Sc. (Biology) Instituto Politécnico Nacional (IPN), México City, Mexico.
Advisor: Oscar F. Francke
Thesis: Catalog of Amblypygids, Uropygids and Solifugids at the National Arachnid Collection

PUBLICATIONS

Peer reviewed

- Gainett G, **Ballesteros JA**, Kanzler CR, Zehms JT, Zern JM, Aharon S, Gavish-Regev E, Sharma PP (2020) Systemic paralogy and function of retinal determination network homologs in arachnids. (in revision) *BMC Genomics* (preprint doi: <https://doi.org/10.1101/2020.04.28.067199>).
- §**Ballesteros JA**, §Setton EW, §Santibáñez-López CE, Arango CE, Brenneis G, Brix S, Cano-Sánchez E, Corbett, KF, Dandouch M, Dilly GF, Eleaume MP, Gainett G, Gallut C, McAtee S, McIntyre L, Moran AL, Moran R, López-González PJ, Scholtz G, Williamson C, Woods HA, Zehms JT, Wheeler WC, Sharma PP (2020) Phylogenomic resolution of sea spider diversification through integration of multiple data classes.

Molecular Biology and Evolution (doi: 10.1093/molbev/msaa228) §Equally contributing authors).

12. §**Ballesteros JA**,§ Santibáñez-López CE, Kováč L, Gavish-Regev E, Sharma PP (2019) Ordered phylogenomic subsampling enables diagnosis of systematic errors in the placement of the enigmatic arachnid order Palpigradi. *Proceedings of the Royal Society B*, 286(1917):20192426. (§Equally contributing authors).
11. Aharon S, **Ballesteros JA**, Crawford, AR, Friske K, Gainett G, Langford B, Santibáñez-López, CE, Ya'aran S, Gavish-Regev E, Sharma PP (2019) The anatomy of an unstable node: a Levantine relict precipitates phylogenomic dissolution of higher-level relationships of the armoured harvestmen (Arachnida: Opiliones: Laniatores). *Invertebrate Systematics*, 33(5):697–717. (Featured on the journal cover)
10. **Ballesteros JA**, Sharma PP (2019) A critical appraisal of the placement of Xiphosura (Chelicerata) with account of known sources of phylogenetic error. *Systematic Biology*, 68(6):896–917. (Featured on the journal cover and covered by the National Geographic Society).
9. Santibáñez-López CE, Kriebel R, **Ballesteros JA**, Sharma PP (2018) Integration of phylogenomics and molecular modeling reveals lineage-specific diversification of toxins in scorpions. *PeerJ*, 6:e5902.
8. Fernández R, Kallal RJ, Dimitrov D, **Ballesteros JA**, Arnedo MA, Giribet G, Hormiga G (2018) Phylogenomics, diversification dynamics, and comparative transcriptomics across the spider tree of life. *Current Biology*, 28(9):1489–1497.
7. **Ballesteros JA**, Hormiga G (2018) Species delimitation of the orchard spider *Leucauge venusta* in North America (Araneae: Tetragnathidae). *Molecular Phylogenetics and Evolution*, 121:183–197
- *6. **Ballesteros JA**, Hormiga G (2016) A new orthology assessment method for phylogenomic data: Unrooted Phylogenetic Orthology. *Molecular Biology and Evolution* 33(8):2117–2134
5. Wang F, **Ballesteros JA**, Hormiga G, Chesters D, Zhan Y, Sun N, Zhu C, Chen W, Tu L (2015) Resolving the phylogeny of a speciose spider group, the family Linyphiidae (Araneae). *Molecular Phylogenetics and Evolution*, 91:135–149
4. Betancur-R R, Broughton RE, Wiley EO, Carpenter K, López JA, Li C, Holcroft NI, Arcila D, Sanciangco M, Cureton II JC, Zhang F, Buser T, Campbell MA, **Ballesteros JA**, Roa-Varon A, Willis S, Borden WC, Rowley T, Reneau PC, Hough DJ, Lu G, Grande T, Arratia G, Ortí G (2013) The tree of life and a new classification of bony fishes. *PLoS currents Tree of Life*, 5.
3. Betancur-R R, Li C, Munroe TA, **Ballesteros JA**, Ortí G (2013) Addressing gene tree discordance and non-stationarity to resolve a multi-locus phylogeny of the flatfishes (Teleostei: Pleuronectiformes). *Systematic Biology*, 62:763–785
2. **Ballesteros JA**, Francke OF (2007) A new species of sun-spider from sand dunes in Coahuila, Mexico, (Arachnida: Solifugae: Eremobatidae). *Zootaxa*, 1665:61–68
1. **Ballesteros JA**, Francke OF (2006) *Mastigoproctus lacandonensis*, especie nueva de vinagrillo (Thelyphonida, Arachnida) de la selva Lacandona, Chiapas, México. In: Estrada, V.E.G., Romero N., J., Equihua M., A., Luna L., C. and Rosas A., J. (eds), *Entomología Mexicana*. Manzanillo, Colima, vol. 5 (1), 156–160.

Book chapters

1. Hormiga G, **Ballesteros JA** (2014) Chapter 26: Panarthropods: Arthropods and Their Closest Relatives. *In: The Tree of Life*. Vargas & Zardoya (eds.) Sinauer Associates, Inc., pp. 305-314.

GRANTS AND AWARDS

As co-author*

- 2020** National Science Foundation-Binational Science Foundation (NSF-BSF), Division of Integrative and Organismal Systems (NSF IOS-2016141; \$1,798,568 [UW-Madison: \$1,476,836])
- 2020** Binational Science Foundation (BSF-2019216; \$240,000 [UW-Madison: \$118,100])

(*Postdoctoral fellows are not permitted to serve as co-PIs on federal grant at the University of Wisconsin-Madison.)

As principal investigator

- 2018** National Geographic Society Research Grant NGS-271R-18. Project: “The evolution of blindness in cave arachnids of the Levant” (\$24,167 USD)
- 2018** *Genes* Conference Travel Award for Postdoctoral Fellows (\$900 USD)
- 2017-19** Michael Guyer Postdoctoral fellowship, University of Wisconsin (\$24,000 USD)
- 2014** Edith Mortensen fund for research in invertebrates, The George Washington University. Project: “Species boundaries in the North American orchard-spider” (\$3,000.00 USD)
- 2012-15** Weintraub doctoral fellowship, The George Washington University (\$22,000 USD).
- 2010-16** Harlan graduate summer research fellowship, The George Washington University (\$5,500 USD)

TEACHING EXPERIENCE

Main instructor

- 2020** Zoology/Botany/Env. Studies 260. Introductory Ecology (online course). Summer term, University of Wisconsin-Madison.
- 2019** Zoology/Biology 101. Introductory Biology, Summer term, University of Wisconsin-Madison.
- 2014-16** Introduction to Bioinformatics, special training for the Harlan undergraduate research program. Summer term, The George Washington University.

Teaching assistant

- 2016** BiSc-1008 Understanding Organisms through service learning, The George Washington University.
- 2010-2012** BisSc-1008/1009 Introductory Biology for non-science majors. Fall and Spring terms. The George Washington University.

UNDERGRADUATE MENTORING

- 2018** Mentor to Paula Thuo for the annual Undergraduate Research Symposium (UW-Madison). Deliverable: student poster presentation, “Tracing the Development of the Nervous System in Arachnids with Fluorescent Antibodies”.
- 2015-16** Mentor to Maya Wolf for undergraduate honors thesis research (George Washington University). Deliverable: honors thesis, “Understanding spider Evolution with novel genetic markers”

SELECTED CONGRESSES AND SYMPOSIA

- 2020** An integrative investigation of eye loss in Levantine arachnids. Meeting of the Society of Integrative and Comparative Biology, Austin, Texas. *Oral presentation.*
- 2019** Orthology and phylostratigraphy unravel the contribution of new genes in the development of chelicerates. Biennial meeting of the Pan-American Society of Evolutionary Developmental Biology, Miami, Florida. USA. *Poster.*
- 2018** A genomic timeline for the evolution and diversification of sea spiders. Meeting of the Society of Molecular Biology and Evolution (SMBE). Yokohama, Japan. *Oral presentation.*
- 2018** The evolution of the chelicerate genome: Sorting out gene expansions in old radiations. Meeting of the Society of Integrative and Comparative Biology, San Francisco, California, USA. *Oral presentation.*
- 2016** When the leaf breaks: Unrooted Phylogenetic Orthology for Phylogenomics. Ernst Mayr Award Symposium. Evolution meeting, Austin, Texas, USA. *Oral presentation.*

INVITED TALKS

- 2020** “The phylogeny of Chelicerata”. Young Arachnologists series, VI Latin-American Congress of Arachnology, Buenos Aires, Argentina (held virtually).

- 2019** “Integrative investigation of mechanisms underpinning eye loss in Levantine arachnids.” University of Wisconsin-Madison Biology Colloquium, Madison Wisconsin, USA.
- 2019** “Integrating bioinformatic tools & genome-scale datasets to decipher the evolution of arthropods.” Frontiers in Genomics Seminar Series, Center for Genomic Sciences, UNAM, Cuernavaca, Mexico.
- 2017** “The evolution of the chelicerate genome: Sorting out gene expansions in old radiations.” Evolution Seminar Series, University of Wisconsin-Madison, Madison, Wisconsin, USA.
- 2016** “From 2 to 20,000 genes: a window into the evolutionary history of the orchard spider *Leucauge venusta*.” Friday seminar series, Department of Biological Sciences, The George Washington University, Washington, DC, USA.

FIELDWORK EXPERIENCE

- 2018** **Israel.** Expedition to caves in the Levant as part of the National Geographic funded research project to study the evolution of cave arachnids.
- 2014** **United States.** Collected orchard-spiders *L. venusta* and other orbweavers across a transect from Pennsylvania to Florida, west and east to the Appalachians.
- 2013** **Costa Rica.** Collected spiders for the project “Neotropical linyphiids of the subfamily Dubiaraneinae”.
- 2012** **Brazil.** Arachnological expedition into the Amazon rainforest (Manaus, Brazil).
- 2006-10** **Mexico.** Assistant collection manager of the orders Amblypygi, Uropygi and Solifugae of CNAN (National Arachnids Collection at IB-UNAM, Mexico).

PROFESSIONAL SERVICE

Referee/reviewer: *PeerJ*, *PLoS One*, *Zootaxa*, *Aracnologia*, *BMC Evolutionary Biology*, *Invertebrate Systematics*, *Hydrobiologia*, *Frontiers in Ecology and Evolution*.

Executive member: Reviewer board of *Diversity* since 2020.

Academic society memberships: Society of Systematic Biologist (2013-present), Society for Molecular Biology and Evolution (2018-present), International Society of Arachnology (2014-present), Society of Integrative and Comparative Biology (2018-present), Pan-American Society of Evolutionary Developmental Biology (2019-present)

BIOINFORMATIC SKILLS

Operating Systems: MacOS, Linux (Ubuntu, Fedora, OpenSuse, Red Hat Linux Enterprise, Debian, centOS, Manjaro).

Programming languages: Python, R, BASH, ANSI C, Haskell

Bioinformatics: IQTREE, RAxML, MrBayes, BEAST2, TNT, bowtie, BLAST+, Trinity, gmap, samtools, p4, Trinity, IGV, jModelTest, emboss, deSEQ2, edgeR, salmon.

Others: EMACS, GRASS, QGis, LaTeX, MySQL, SQLite, HTML, CSS, JavaScript, RevealJS, SLURM, CONDOR

LANGUAGES

Spanish (native), English (fluent)