

JOSE ORLANDO COMBITA-HEREDIA

Research Associate

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Pronouns (he/him/his)

Personal statement

Pioneer researcher with 15+ years of experience in the field of Entomology. I, specifically use mites as model organisms to answer questions about behavior, evolution, and symbiotic relationships. Throughout my career, I've applied different tools such as molecular, morphological, and comparative methods to study evolutionary relationships among mites, in a systematics framework. I use a battery of microscopy techniques, including differential interference contrast microscopy (DIC), Confocal Laser Scan Microscopy (CLSM), Low-Temperature Scan Electron Microscopy (LT-SEM), Cryo Scanning Electron Microscopy (Cryo-SEM), Transmission Electron Microscopy (TEM), and Synchrotron X-ray microtomography (SR-mCT) to study sexual selection and feeding mechanisms in mites. I apply a battery of software to analyze data, such as PAUP, TNT, MUSCLE, etc., for systematics and FIJI, Cinema 4 D, Imaris, Drishti, MeshLab, 3D Slicer, Adobe Suite, among others, for image visualization and 3D reconstruction. A major part of my research focus is invested in outreach and education. I was president of the II Latin-American conference in Acarology and was able to raise more than 20 thousand dollars to bring experts from around the world. In addition, I've taught several college courses and programs in the US and abroad in evolution, ecology, parasitology, and field biology, among others. I have also been advisor of a Master's student and undergraduate students in Colombia. I am currently seeking a position in an institution in which I apply my knowledge in different areas of science, develop collaborative projects with different professionals, submit grants, and have a teaching commitment at the graduate and undergraduate levels.

Education

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| 2020 | Ph.D. in Evolution, Ecology and Organismal Biology EEOB. Ohio State University, Columbus, OH. <u>Dissertation</u> : Biodiversity, systematic relationships, ontogeny, and functional morphology of Mesostigmata mites (Acari: Parasitiformes) associated with dung beetles or found on soil of tropical regions. |
| 2013 | M.Sc. in Biology-Systematics. Universidad Nacional de Colombia, Bogota, Colombia. <u>Thesis</u> : Acaros acuáticos (Acari: Hydrachnididae) de Colombia. |
| 2005 | BSc. Universidad Nacional de Colombia. Bogota, Colombia. <u>Research thesis</u> : Ácaros (Arachnida: Acari) asociados a escarabajos pasálidos (Coleóptera: Passalidae) de Colombia. |

Academic Positions and Affiliations

2021 – present **Research Associate.** Biology Department. The University of Washington.

- 2020–2021 **Research Associate.** Acarology Lab. Evolution Ecology and Organismal Biology EEOB The Ohio State University.
- 2016–2020 **Graduate Teacher Assistant.** Evolution Ecology and Organismal Biology EEOB Departments. The Ohio State University.
- 2013–2016 **Graduate Research Assistant.** Evolution Ecology and Organismal Biology EEOB Departments. The Ohio State University.

Peer-reviewed Papers

1. **Cómbita-Heredia, O.**, Gulbranson, C. J., Ochoa, R., Quintero-Gutiérrez, E. J., Bauchan, G., & Klompen, H. (2021). Size, shape, and direction matters: Matching secondary genital structures in male and female mites using multiple microscopy techniques and 3D modeling. *PLOS ONE*, 16(8), e0254974. <https://doi.org/10.1371/journal.pone.0254974>
2. **Cómbita-Heredia, O.**, Quintero-Gutiérrez, E. J., Romero-García, N., & Klompen, H. (2020). The biology of *Megalolaelaps colossus* (Acari: Dermanyssina). *Experimental and Applied Acarology*. <https://doi.org/10.1007/s10493-019-00462-5>
3. Quintero-Gutiérrez, E. J., **Cómbita-Heredia, O.**, & Klompen, H. (2020) Mesostigmatid mites associated with *Oxysternon conspicillatum* (Coleoptera: Scarabaeidae): a new species of *Macrocheles*, description of the male of *M. magna*, and four new records for Colombia. *International Journal of Acarology*, 46:7, 496–512
4. Quintero-Gutierrez EJ, Sandmann D, **Cómbita-Heredia, O.**, Klarner B, Widyastuti R, Scheu S (2020) Review of the mite genus *Krantzolaspina* Datta & Bhattacharjee (Mesostigmata, Parholaspididae) with re-description of *K. angustatus* comb. nov. (Ishikawa) from Indonesia. *ZooKeys* 997: 47–68. <https://doi.org/10.3897/zookeys.997.54262>
5. Malacrinò A., Sadowski V. A., Martin T. K., Cavichioli de Oliveira N., Brackett I. J., Harris K. J., **Cómbita-Heredia, O.**, Vescio R., & Bennett A. E. (2020) Biological invasions alter environmental microbiomes: A meta-analysis. *PLOS ONE* 15(10): e0240996. <https://doi.org/10.1371/journal.pone.0240996>
6. Quintero-Gutiérrez, E. J., Sandmann, D., **Cómbita-Heredia, O.**, Klarner, B., Widyastuti, R., & Scheu, S. (2020). A new species of the genus *Lasioseius* (Acari: Blattisociidae) inhabiting litter of secondary rainforest in Sumatra, Indonesia. *Acarologia*, 60(Volume 60), 338–352. <https://doi.org/10.24349/acarologia/20204371>
7. Beaulieu, F., Quintero-Gutiérrez, J. E., Sandmann, D., Klarner, B., Widyastuti, R., **Cómbita-Heredia, O.**, & Scheu, S. (2019). Review of the mite genus *Oloaelaps* (Acari, laelapidae) and redescription of *O. formidabilis* Berlese. *ZooKeys*, 2019(853), 1–36. <https://doi.org/10.3897/zookeys.853.29407>
8. **Cómbita-Heredia, O.**, Quintero-Gutiérrez, E. J., & Klompen, H. (2018). Ontogeny of *Megalolaelaps colossus* sp. nov. (Acari: Megalolaelapidae), an enigmatic symbiont of dung beetles (Coleoptera: Scarabaeidae) in Colombia. *Systematic and Applied Acarology*. <https://doi.org/10.11158/saa.23.6.7>
9. A redescription of *Balaustium leanderi* comb. nov. (Actinotrichida, Erythraeidae) with first report on characteristics of all active instars and taxonomic notes on the genus. (2014)

Luz Stella Fuentes, Karen Muñoz-Cárdenas, **Orlando Combita**, Elisa Jimeno, Juan Carlos Getiva De La Hoz, Fernando Cantor, Daniel Rodriguez, Joanna Małkol. Florida Entomologist. Vol. 97(3), 937-951. <https://doi.org/10.1653/024.097.0352>

Other publications

Abstracts

1. Ácaros Acuáticos De Colombia. Asociación Colombiana de Zoología. 2015. La biodiversidad sensible: patrimonio natural irremplazable. IV Congreso Colombiano de Zoología. Libro de resúmenes. Asociación Colombiana de Zoología. ISSN 2422-5134 available online at www.aczcolombia.org
2. Acaros (Arachnida: Acari) asociados a escarabajos pasalidos (Coleoptera: Passalidae) de Colombia. Acta Biológica Colombiana. Volumen 11. No. 1. Bogota Colombia, 2006. p. 138, 2006. ISSN electrónico 1900-1649. ISSN impreso 0120-548X. <https://revistas.unal.edu.co/index.php/actabiol/article/view/27495/0>

Proceedings editions

1. Proceedings Congreso Latinoamericano de Acarología - Speakers Proceedings. II CLAc. Sociedad Latinoamericana de Acarología, Montenegro, Quindío, Colombia, 27 a 31 de mayo de 2016. Publicación electrónica, p 128. ISSN: 2500-8382
2. Proceedings Congreso Latinoamericano de Acarología - Posters and Oral Presentations. II CLAc. Sociedad Latinoamericana de Acarología, Montenegro, Quindío, Colombia, 27 a 31 de mayo de 2016. Publicación electrónica, p 72. ISSN: 2500-8382

Professional Meetings

Invited Talks

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| 2022 | Biodiversity Thursdays Jueves, Hablando de Ácaros" (Speaking of Mites). Adding a new dimension to acarology. Virtual talk. Sociedad Latinoamericana de Acarologia. |
| 2021 | Hablando de Ácaros" (Speaking of Mites). Water mites. Virtual talk. Sociedad Latinoamericana de Acarologia |
| 2018 | Integrating new technologies for the study of evolution in mites. III Congreso Latinoamericano de Acarologia & VI Simpósio Brasileiro de Acarologia. Invited speaker. July 29 to August 02, 2018. Pirenópolis, Goiás, Brazil |
| | Ohio Acarology Summer Program - 78 years teaching Acarology. III Congreso Latinoamericano de Acarologia & VI Simpósio Brasileiro de Acarologia. Invited speaker. July 29 to August 02, 2018. Pirenópolis, Goiás, Brazil |

Oral Presentations

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| 2018 | Combita-Heredia, O. , Quintero-Gutiérrez, E., Klompen, H. The Megalolaelapidae awakens: systematic revision and biology of Megalolaepidae (Mesostigmata: Dermanyssina) XV International Congress of Acarology. 2 to 8 September 2018. Antalya, Turkey. |
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- 2017 **Combata-Heredia, O.**, Ontogeny, ecology and systematic relationships of the extremely large size mites Megalolaelapidae (Mesostigmata: Eviphidoidea). Current Advances in Acarology Meeting. ESA's 65th Annual Meeting, November 5-8 Denver, Colorado.
- 2016 **Combata-Heredia, O.**, & Quintero-Gutierrez E. J. Primer reporte de un ácaro limpiador y una nueva especie de *Laelaspoides* (Mesostigmata: Laelapidae) asociado a abejas de las orquídeas (Hymenoptera: Apidae: Euglossini) en el caribe de Panamá, p. 32. In: Proceedings II Congreso Latinoamericano de Acarología - Posters and Oral Presentations. II CLAc. Sociedad Latinoamericana de Acarología, Montenegro, Quindío, Colombia, 27 a 31 de mayo de 2016. Electronic Publication, p. 72. ISSN: 2500-8382.
- Combata-Heredia, O.**, (2016). Integrating new technologies for the study of evolution in mites, p. 58. In: Proceedings II Congreso Latinoamericano de Acarología - Speakers Proceedings. II CLAc. Sociedad Latinoamericana de Acarología, Montenegro, Quindío, Colombia, 27 a 31 de mayo de 2016. Electronic Publication, p. 128. ISSN: 2500-8382.
- Quintero-Gutierrez E. J.*, & **Combata-Heredia, O.**, (2016). The secret benefit: the value for biodiversity studies of associates of specimens in natural history collections, with an example from mites associated with dung beetles, p. 47. In: Proceedings II Congreso Latinoamericano de Acarología - Posters and Oral Presentations. II CLAc. Sociedad Latinoamericana de Acarología, Montenegro, Quindío, Colombia, 27 a 31 de mayo de 2016. Electronic Publication, p. 72. ISSN: 2500-8382.
- Quintero-Gutierrez E. J.*, & **Combata-Heredia, O.**, (2016). Description and life cycle of the coffee grain mite *Megalolaelaps* sp. nov. (Mesostigmata: Megalolaelapidae) in the coffee region in Quindio, Colombia, p. 32. In: Proceedings II Congreso Latinoamericano de Acarología - Posters and Oral Presentations. II CLAc. Sociedad Latinoamericana de Acarología, Montenegro, Quindío, Colombia, 27 a 31 de mayo de 2016. Electronic Publication, p. 72. ISSN: 2500-8382.
- 2012 **Combata-Heredia, O.**, Lista de Acaros Acuaticos (Acari: Hydracnida) en Colombia. In: Proceedings I Congreso Latinoamericano de Acarología Pag: 343-348. ISBN: 978-607-715-048-0.
- Combata-Heredia, O.**, Morfotipos de acaridae y Macrochelidae presentes en nidos y obreras del abejorro nativo *Bombus atratus* (HYMENOPTERA: APIDAE). In: Proceedings I Congreso Latinoamericano de Acarología. Pag: 360-364. ISBN: 978-607-715-048-0.
- 2011 **Combata-Heredia, O.**, Acaros acuaticos de Colombia (Acari: Hydrachnida): estado actual del conocimiento. SOCOLEN 2011 Proceedings of the XXXVIII Congreso Colombiano de Entomología. Pag: 363-375. ISBN 978-958-99120-5-8.

Poster presentations

- 2010 **Combata-Heredia, O.** Mites and the importance of new research in Colombia. Proceedings of the XXVII Congress of the Colombian Society of Entomology SOCOLEN. <http://www.socolen.org.co>
- Combata-Heredia, O.** Acari y la importancia de nuevos estudios en Colombia. In K.

Wyckhuys, A. Rodríguez, M. C. Mejía, & C. Martínez (Eds.), Libro de Memorias 37° Congreso Sociedad Colombiana de Entomología (pp. 137–138). Sociedad Colombiana de Entomología. <http://www.socolen.org.co>

Combita-Heredia, O. Ácaros (Arachnida: Acari) asociados a escarabajos pasálidos (Coleoptera: Passalidae) en Colombia. In P. Muñoz (Ed.), Libro de Resúmenes 37° Congreso Sociedad Colombiana de Entomología (p. 87). Sociedad Colombiana de Entomología. <http://www.socolen.org.co>

Combita-Heredia, O. Ácaros (Arachnida: Acari) fuente de alimento para ranas del trópico. In P. Muñoz (Ed.), Libro de Resúmenes 37° Congreso Sociedad Colombiana de Entomología (p. 169). Sociedad Colombiana de Entomología. <http://www.socolen.org.co>

Combita-Heredia, O. Ácaros (Arachnida: Acari) presentes en necromasa del frailejón *Espeletia pycnophylla* ssp. *angelensis* (Asterales: Asteraceae). In P. Muñoz (Ed.), Libro de Resúmenes 37° Congreso Sociedad Colombiana de Entomología (p. 88). Sociedad Colombiana de Entomología. <http://www.socolen.org.co>

Grant Support and Awards

1. COLCIENCIAS Scholarship PhD program beneficiary. COLCIENCIAS: National science foundation supported by the National Government. This fellowship is intended to increase the access of Colombian citizens to high-quality postgraduate study programs abroad. 2013. Amount awarded \$250,000.00
2. PRO ACAROLOGIA BASIELIENSIS, PBA GRANT. Research Fellowship for Water Mites of Colombia Project. Basel, Suiza. 2007-2010. Amount awarded \$15,000.00
3. OHIO STATE UNIVERSITY, D. E. JOHNSTON MEMORIAL FUND AWARD. Acarology Summer Program, Columbus OH, USA. 2006. Amount awarded \$400.
4. Attendance Fellowship for III National Zoology Congress. November 2010, Medellín, Colombia Amount awarded \$500.
5. Attendance Fellowship for IV National Zoology Congress. December 2014, Cartagena, Colombia. Amount awarded \$500.

Graduate and BSc. Committees

Chair

- 2020 Edwin J. Quintero Gutierrez. **MSc.** Universidad de Caldas, Manizales Colombia. Mites associated to dung beetles in the coffee region of Colombia. Honors Thesis

Member

- 2018 Juan Camilo Lara-Contreras **MSc.** Universidad Nacional de Colombia.
- 2017 Elisa Jimeno. **MSc.** Universidad Jorge Tadeo Lozano. Colombia 2016.
- 2013 Katherine Munevar. **BSc.** Universidad Javeriana. Colombia.

BSc Advisor:

- 2021 Nicolas Briceno-Avellaneda. **BSc**. Universidad del Bosque. Colombia.
- 2014 Edwin Quintero, Nicole Romero. **BSc**. Universidad del Quindio, Colombia.
- 2013 Carlos Pinilla-Cruz. **BSc**. Universidad Militar Nueva Granada. Colombia.

Teaching

Graduate Teaching Assistant

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| 2021 Spring | EEOB 2270 Parasite Evolution. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Hans Klompen. |
| 2020 Autumn | EEOB 2510 Human Anatomy. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Leslie Jackson. |
| 2020 Summer | EEOB 2510 Human Anatomy. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Leslie Jackson. |
| 2020 Spring | EEOB 2510 Human Anatomy. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Leslie Jackson. |
| 2019 Autumn | EEOB 3520 Micro Anatomy. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Leslie Jackson. |
| 2019 Summer | EEOB 2510 Human Anatomy. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Leslie Jackson. |
| 2019 Spring | BIOLOGY 1114 Form, Function & Ecology. Center for Life Science Education. (CLSE). Ohio State University. Columbus, Ohio. Supervisor: Jonathan Horn. |
| 2018 Autumn | EEOB 3520 Micro Anatomy. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Leslie Jackson. |
| 2018 Summer | EEOB 3520 Acarology Summer Program. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Hans Klompen. |
| 2018 Spring | EEOB 3010 Evolution. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Andrea Wolfe, Allison Bennett. |
| 2017 Autumn | Biology 1114 Form, Function & Ecology. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Roman Lanno. |

2017 Summer	EEOB 3520 Acarology Summer Program. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Hans Klompen.
2017 Spring	Biology 1114 Form, Function & Ecology. Center for Life Science Education (CLSE). Ohio State University. Columbus, Ohio. Supervisor: Jimmy Chiucchi.
2016 Autumn	Biology 1114 Form, Function & Ecology. Center for Life Science Education (CLSE). Ohio State University. Columbus, Ohio. Supervisor: Jimmy Chiucchi.
2016 Summer	EEOB 3520 Acarology Summer Program. Ecology Evolution and Organismal Biology Department. Ohio State University. Columbus, Ohio. Supervisor: Hans Klompen.
2016 Spring	Biology 1114 Form, Function & Ecology Center for Life Science Education (CLSE). Ohio State University. Columbus, Ohio. Supervisor: Robin Taylor.

College Level Teaching Abroad

2015	Mites associated to vertebrates in the neotropics. Universidad Nacional de Colombia. Bogota, Colombia. May 2015
	Functional ecology of mites in neotropical ecosystems. Universidad de Bogota Jorge Tadeo Lozano Bogota. Colombia. May 2015
2012	Med-Vet and water mites workshop. Benemerita Universidad de Puebla. Ciudad de Puebla, Mexico. May 2012.
2011	Field trip Teaching Assistant. Animal Taxonomy, Universidad Militar Nueva Granada, San Martin, Meta, Colombia, November 2011. Universidad Militar Nueva Granada, Bogota, Colombia.
	Field trip Teaching Assistant. Ecology, Universidad Militar Nueva Granada, Tatacoa dessert, Huila Colombia, October 2011. Universidad Militar Nueva Granada, Bogota, Colombia.
	Field trip Teaching Assistant. Evolution, Universidad Militar Nueva Granada, San Antonio del Tequendama, Cundinamarca, Colombia, October 2011. Universidad Militar Nueva Granada, Bogota.

High school teaching

2010	Science Teacher. EDUPOL COLOMBIA SAS. Transition to college. August 2010 – December
2009.	Chemistry and Environmental Sciences. EDUPOL COLOMBIA SAS. Workshop (equivalent to GRE course). September 2009 – September 2010
2006	Biology and Chemistry Teacher. San Carlos High School Bogota, Colombia. 2006

Others

Designer of educational field trips for schools and colleges that fulfill the Colombian National Education Standards for Science. September 2010 – June 2013. Selva Colombia LLC.

Service

Service at OSU

2013-2019 Open House, Museum of Biological Diversity. EEOB Department.

Peer Reviewer Scientific Journals

1. International Journal of Acarology
2. Journal of Medical Entomology

Highlighted Research



1. Journal Cover from: <https://doi.org/10.1080/01647954.2020.1815838>
2. Journal Cover from: <https://doi.org/10.1007/s10493-019-00462-5>
3. Photography competition: First place in II national competition “Universalmente Pequeño” from Sanitas Lab Technology. Colombia 2021. Available at: <https://doi.org/10.1371/journal.pone.0254974>
4. Book cover design available at: <https://www.researchgate.net/profile/Orlando-Combata>

Science Communication

Work with the news media

Interviews

1. Radio Interviews: Agencia de Noticias Universidad Nacional: Interview on application and diversity of water mites. June 2010: <https://agenciadenoticias.unal.edu.co/detalle/aquatic-acari-could-be-used-as-natural-controllers>
2. Radio Interviews: Radio Universidad Nacional de Colombia. “Natural...mente”: Mites with Orlando Combata http://radio.unal.edu.co/detalle/los-acaros-con-orlando-combita?fbclid=IwAR0XJX-1X8CQaET6j7oDrW2VzWS_yctyv3WDwGw_Uz7weDnCdJ2QrW0BH1Y