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 Dpt Paleobiology  
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## Research Interests

My main interest is to understand the mechanisms underlying the phenotypic evolution and the diversification in mammals, particularly ungulates. These two facets of evolution have intertwined in complex ways to produce the diversity of mammals that we observe today and in the fossil record. To uncover major macroevolutionary processes, I employ a range of approaches including phylogenetic methods, models of speciation and extinction dynamics, 3D geometric morphometrics, and analyses of faunal transitions. My work integrates multiple methodological perspectives and involves collaborations with researchers from different backgrounds and institutions across Europe, South America, North America and Asia. I am the author of more than 40 publications, including one first-author and three senior-author papers in *Science*.

## Current Position

2023 – present Research Scientist, Department of Paleobiology  
 Museo Nacional de Ciencias Naturales (MNCN-CSIC)

## Previous Positions & Fellowships

2018 – 2023 Talent Attraction Program, Universidad de Alcalá de Henares  
 2017 – 2018 DFG Postdoctoral Contract, Museum für Naturkunde (Berlin)  
 2015 – 2017 Humboldt Postdoctoral Fellowship, Museum für Naturkunde (Berlin)  
 2012 – 2014 Postdoctoral Contract, MNCN-CSIC  
 2007 – 2011 Predoctoral Grant - University Personnel Formation (FPU), MNCN - CSIC  
 2007 I3P Contract, MNCN-CSIC

## Education

2011 PhD. Department of Paleontology, Universidad Complutense de Madrid  
 Thesis: *Evolutionary and ecological analyses of ruminants based on phylogenetic data*. Defended in Nov. 2011. Cum laude.  
 2005 – 2007 M.Phil. Department of Paleontology, Universidad Complutense de Madrid  
 2000 – 2005 M.Sc. Faculty of Biological Sciences  
 Universidad Complutense de Madrid

## Scientific Duties

2025 – present Associate Editor, *Paleobiology*  
 2028 – present Editorial Board Member, *Biology Letters*

## Recent funding

**Title:** Bridging the adaptive and structural facets of ungulate skull evolution [BRIDGE-US]  
**Research Project** PID2024-155435NB-I00, 116.250 € financed by the *Ministerio de Ciencia, Innovación y Universidades*  
**Organism:** Museo nacional de Ciencias Naturales [CSIC] and Universidad de Alcalá  
**Time frame:** 09.2025-08.2029  
**Principal researcher:** Juan López Cantalapiedra & Oscar Sanisidro

**Title:** Trends in Evolution [TrEvol]  
**Research Project** CNS2023-144573, 199.944 € financed by the *Ministerio de Ciencia, Innovación y Universidades*  
**Organism:** Museo nacional de Ciencias Naturales [CSIC]  
**Time frame:** 2024-2026  
**Hired personnel:** 1 postdoc researcher  
**Principal researcher:** Juan López Cantalapiedra

**Title:** Taxonomic and phenotypic diversification of Cenozoic terrestrial large herbivores  
**Research Project** 2017-T1/AMB-5298, 440.000€ financed by the *Talent Attraction Program* (Madrid Government) and the Universidad de Alcalá de Henares  
**Organism:** Universidad de Alcalá de Henares  
**Time frame:** 2018-2023  
**Hired personnel:** 1 postdoc researcher  
**Principal researcher:** Juan López Cantalapiedra

### Main Publications

- Blanco F, Lazagabaster I, Sanisidro O, Bibi F, Heckeberg N, Ríos M, Mennecart B, Alberdi MT, Prado JL, Saarinen J, Silvestro D, Müller J, Calatayud J, **Cantalapiedra JL** (2025) Two major ecological shifts shaped 60 million years of ungulate faunal evolution. *Nat Commun.* 16, 4648. doi: 10.1038/s41467-025-59974-x.
- Boscaini A, Casali DM, Toledo N, **Cantalapiedra JL**, Bargo MS, De Iuliis G, Gaudin TJ, Langer MC, Narducci R, Pujos F, Soto EM, Vizcaíno SF, Soto IM (2025) The emergence and demise of giant sloths. *Science*, 388, 864-868. doi: 10.1126/science.adu0704.
- Hauffe T, **Cantalapiedra JL** & Silvestro, D (2024). Trait-mediated speciation and human-driven extinctions in proboscideans revealed by unsupervised Bayesian neural networks. *Sci Adv.* 10, eadl2643.
- Nascimento, JCS, Blanco F, Domingo MS, **Cantalapiedra JL** & Pires, MM (2024). The reorganization of predator-prey networks over 20 million years explains extinction patterns of mammalian carnivores. *Ecol Lett.* 27, e14448.
- Chiarenza AA, **Cantalapiedra JL**, Jones LA, Gamboa S, Galván S, Farnsworth AJ, Valdes PJ, Sotelo G, Varela S. (2024). Early Jurassic origin of avian endothermy and thermophysiological diversity in dinosaurs. *Current Biology*. doi: 10.1016/j.cub.2024.04.051
- Cantalapiedra JL**, Sanisidro O, Cantero E, Prado JL & Alberdi MT (2023). Evolutionary radiation of horses. In *The Equids: a suite of splendid species* (eds. Prins HTH & Gordon IJ). Pp 27-45. doi: 10.1007/978-3-031-27144-1\_2
- Bibi F & **Cantalapiedra JL** (2023). Plio-Pleistocene African megaherbivore losses associated with community biomass restructuring. *Science* 380:1076–1080. doi: 10.1126/science.add8366
- Sanisidro O, Muhlbachler MC, **Cantalapiedra JL** (2023) A macroevolutionary pathway to megaherbivory. *Science* 380, 616–618. doi: 10.1126/science.ade1833
- Cantalapiedra JL**, Sanisidro O, Zhang H, Alberdi MT, Prado JL, Blanco F, Saarinen J (2021) The rise and fall of proboscidean ecological diversity. *Nat Ecol Evol.* 5, 1266-1272. doi: 10.1038/s41559-021-01498-w
- Blanco F, Calatayud J, Martín-Perea DM, Domingo MS, Menéndez I, Müller J, Hernández Fernández M, & **Cantalapiedra JL** (2021) Punctuated ecological equilibrium in mammal communities over evolutionary time scales. *Science* 372:300–303. doi: 10.1126/science.abd5110.

- Cantalapiedra JL, Aze T, Cadotte M, Valentina Dalla Riva G, Huang D, Mazel F, Pennell M, Ríos M, Mooers AØ (2019) Conserving evolutionary history does not result in greater diversity over evolutionary time scales. *Proc R Soc B*. 286. doi: 10.1098/rspb.2018.2896
- Tucker CM, Aze T, Cadotte M, Cantalapiedra JL, Chisholm C, Díaz S, Grenyer R, Huang D, Mazel F, Pearse WD, Pennell MW, Winter M, Mooers AØ (2019) Assessing the utility of conserving evolutionary history. *Biological Reviews*. 94: 1740-1760. doi: 10.1111/brv.12526
- Pimiento C, Cantalapiedra JL, Shimada K, Field DJ, Smaers JB (2019) Evolutionary pathways towards gigantism in sharks and rays. *Evolution*. 73: 1-12. doi: 10.1111/evo.13680.
- Ramm T, Cantalapiedra JL, Wagner P, Penner J, Mark-Oliver O, Müller J (2018) Divergent trends in functional and phylogenetic structure in reptile communities across Africa. *Nat Commun*. 9: doi:10.1038/s41467-018-07107-y
- Cantalapiedra JL, Domingo MS, Domingo L (2018) Multi-scale interplays of biotic and abiotic drivers shape mammalian sub-continental diversity over millions of years. *Sci Rep*. 8:1-8. doi: 10.1038/s41598-018-31699-6
- Cantalapiedra JL, Prado JL, Hernández Fernández M, Alberdi MT (2017) Decoupled ecomorphological evolution and diversification in Neogene-Quaternary horses. *Science*. 355: 627-630. doi:10.1126/science.aag1772.
- Cantalapiedra JL, Hernández Fernández M, Azanza B, Morales J (2015) Congruent phylogenetic and fossil signatures of ruminant diversification dynamics driven by Tertiary climate change. *Evolution* 69(11):2941-2953. DOI: 10.1111/evo.12787.
- Cantalapiedra JL, FitzJohn RG, Hernández Fernández M, DeMiguel D, Azanza B, Morales J, Mooers AØ (2014) Dietary innovations spurred the diversification of ruminants during the Cenozoic. *Proc R Soc B*. 281(1776).
- Cantalapiedra JL, Hernández Fernández M, Morales J (2014) The biogeographic history of ruminant faunas determines the phylogenetic structure of their assemblages at different scales. *Ecography* 37(1): 1-9.

## Mentoring & Supervision

### PhD Theses

- 2022 PhD thesis, co-supervisor. PhD student Fernando Blanco - *Major factors controlling diversity in Cenozoic terrestrial mammals*. Humboldt Universitat, Berlin.
- 2021 PhD thesis, co-supervisor. PhD student Sara Gamboa Jurado-Centurión - *Influence of Cenozoic climatic and tectonic events on the macroevolutionary processes of flying organisms*. Universidad Complutense de Madrid
- 2015 PhD thesis, co-supervisor. PhD student Johnathan Pelegrín Ramírez - *Paleobiogeography, global climate changes and macroevolution in non-passerines birds: radiation, dispersion and adaptation patterns during the Cenozoic*. Universidad Complutense de Madrid

### Master's Theses

- 2025 Master thesis, co-supervisor. Student Julián de las Casa González. Universidad Complutense de Madrid
- 2022 Master thesis, co-supervisor. Student Sergio López Moreno. Universidad de Alcalá
- 2015 Master thesis, co-supervisor. Student Álvaro Fueyo Rodríguez. Universidad Complutense de Madrid

## Teaching

- 2018 – 2023 *Paleoecology, Macroevolution and Diversification* (Environmental Sciences degree) and *Ecology* (Biology degree) at the Universidad de Alcalá. 390 hours
- 2012 – 2025 *Introduction to Macroevolutionary Analyses using Phylogenies*. Transmitting Science. 560 hours

**Fieldwork**

- 2024 – 2025 Cerro Arenoso, Oligocene. Loranca del Campo (Spain).
- 2008 – 2013 Somosaguas, Middle Miocene. Madrid (Spain). Instructor and co-director (2008 – 2010, 2013)
- 2007 Toril 3A, Middle Miocene. Daroca (Spain).
- 2005 – 2014 Cerro de los Batallones, Late Miocene. Madrid (Spain). Instructor