

Mario Coiro

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mcoiro

Employment history

- 2025-current **Emmy Noether Junior Group Leader**, Senckenberg Research Institute and Natural History Museum, Frankfurt am Main, Germany
- 2024 **Technician**, Work Group of Functional Ecophysiology of Plants, University of Hohenheim, Germany
- 2022-2024 **Lise Meitner Postdoctoral Fellow**, Dept. of Paleontology, University of Vienna, Austria
- 2019-2021 **Technical/Postdoctoral assistant**, Dept. of Biology, Univ. of Fribourg, Switzerland

Education

- 2019 **PhD program in Evolutionary Biology**, Univ. of Zürich, Switzerland
Thesis title: *"Evolutionary studies in the Cycadales"*
- 2012 **MSc in Biological Sciences**, Università di Napoli "Federico II", Italy
- 2009 **BS in Agrofood Biotechnologies**, Università di Napoli "Federico II", Italy

Funding

- 2024 **Emmy Noether Programme**, *"Spatial signal and bias in the fossil record of seed plants in the late Mesozoic."*, Deutsche Forschungsgemeinschaft (DFG)
- 2022 **SYNTHESYS**, *"Conifers from the Jurassic of Yorkshire."*, European Union's Horizon 2020 programme (H2020), SYNTHESYS project GB-TAF-TA4-004
- 2021 **Lise Meitner Postdoctoral Fellowship**, *"The birth of the modern world: understanding the evolutionary arena of the Cretaceous Terrestrial Revolution by inferring plant dynamics in the late Mesozoic"*, FWF (Austrian Science Fund), 164,080 EUR for salary and research funds
- 2021 **PostDoc Mobility Grant**, *"A window into the past: disentangling the geological and biological drivers of the Jurassic amber gap"*, SNF (Swiss National Foundation), 101,380 CHF for salary and research funds
Not redeemed
- 2018 **Linnean Society Travel Grant**, *The Linnean Society*, 500 USD to attend the EPPC 2018 conference in Dublin, Ireland
- 2017 **Georges and Antoine Claraz-Donation**, 1000 CHF for research costs and attending the British Ecological Society Macro SIG Meeting
- 2015 **SYNTHESYS**, *"Palaeobiology of the cycads: insights from fossil leaves from the Jurassic of Yorkshire."*, European Union's Seventh Framework Programme (FP7/2007-2013), SYNTHESYS project GB-TAF-5763
- 2015 **SYNTHESYS**, *"Palaeobiology of the cycads: reevaluating Florin's collection in a phylogenetic framework"*, European Union's Seventh Framework Programme (FP7/2007-2013), SYNTHESYS project SE-TAF-5774

Awards

- 2015 **Vernon I. Chadle Award**, *Developmental and Structural Section, Botanical Society of America*, 500 USD to attend the Botany 2015 Conference in Edmonton, Canada

Project collaboration and support

- 2023 **NSF IOS Collaborative Research**, *Senior Supporting Personnel for the project "Did the Neogene aridification drive adaptive ecological radiation in an ancient plant lineage?" awarded to Katherine McCulloh, Cecile Ane, and Christopher Krieg*, National Science Foundation of the USA, Division of Integrative Organismal Systems

Teaching experience

Lecturer

- 2023 *Paleobotany*, University of Vienna, 280144-1.

Teaching assistant

- 2013–2014 *Plant Biochemistry*. ETH Zürich, 551-0359-00L
2015–2019 *Evolution und Biodiversität II: Wirbeltiere und Pflanzen*. University of Zürich, BIO121.
2015 *Evolution*. University of Zürich, BIO113
2016–2018 *Species and Speciation*. University of Zürich, BIO225.

Lectures or seminars

- 2018–2019 *Evolution and paleobiology of plants*. University of Zürich ,BIO265.
2019 *Tropical plant families*. University of Zürich, BIO232.

Student Supervision

- 2016 *Biology Olympiad project*, University of Zürich, Hanna Neuenschwander.
2017 *Bachelor Internship*, University of Zürich, Nicola Jelmini.
2022 *Master Thesis*, University of Vienna, Katharina Halbwidl.

Academic service

Editorial service

- 2018-2023 **Moderator**, *paleorXiv*
2025-current **Member of the Editorial Board**, *Palaeontology*, *Papers in Palaeontology*
2021-2022 **Topic Editor**, *Frontiers in Cell and Developmental Biology*, Managing the research topic "Reciprocal Illumination and Consilience in Plant Evolutionary-Development"

Reviewing experience

I have been invited to review for over 20 international journals across multiple disciplines, including **Biology Letters**, **New Phytologist**, **Philosophical Transactions of the Royal Society B: Biological Sciences**, and **Systematic Biology**.

Institutional service

- 2017-2019 **Library Committee Member**, *Department of Systematic and Evolutionary Botany, University of Zürich*, Switzerland
2016 **Deputee representative for the student body**, *Department of Systematic and Evolutionary Botany, University of Zürich*, Switzerland

Membership in professional Society

- 2016-current **International Organization of Paleobotany**, *member*
2023-current **Botanical Society of America**, *member*
2023-current **Asociation Palentologica Argentina**, *member*

Outreach

- 2015 -2019 **Multiple talks and guided tours for the general public**, *Botanical Garden of the University of Zürich*, Switzerland
2019-current **Creation and curation of the "Extant Plant Paleoart Database" together with Nathan Jud**, https://github.com/PaleoNate/extinct_plants

- 2020-current **Multiple articles for the general public**, *mariocoiro.blog*
- 2018 **Interview for the blog series "PhDetails" by Rishi De-Kayne**, <http://phdetails.blogspot.com/>
- 2022 **Interview for the Youtube channel "Meet Science" on the topic "Paleontology and art" by Michela Leonardi (in Italian)**, <https://www.youtube.com/@MeetScience>
- 2022 **Interview for the research interview series "The Making of Deep Time" by Victor Monnin**, <https://www.themakingofdeeptime.com>

Languages

Italian Native
English C2
German A1

Full Publication list

Journal articles

37, 15 as first/corresponding* author

1. **Coiro M.***, Seyfullah L.J. (2024) *Disparity of cycad leaves dispels the living fossil metaphor*, Communications Biology, 7:328 .
2. Crivelli S., Bartusch K., Ruiz-Sola M.A. , **Coiro M.**, Schmidt Kjølner Hansen S., Truernit E. (2024) *Distinct and redundant roles of the Arabidopsis OCTOPUS gene family in plant growth beyond phloem development*, Journal of Experimental Botany 76(6), 1752-1766.
3. Seyfullah L.J., **Coiro M.**, Vajda V., McLoughlin S., Steinhorsdottir M. (2024) *Detection of in situ resinous traces in Jurassic conifers from floras lacking amber*, Fossil Imprint, 68–76.
4. Le Renard L., Strullu-Derrien C., Berbee M., **Coiro M.*** (2024) *A new leaf inhabiting ascomycete from the Jurassic (ca 170 Mya) of Yorkshire, UK, and insights into the appearance and diversification of filamentous Ascomycota* , IMA fungus 15 (1), 34.
5. **Coiro M.***, McLoughlin S., Steinhorsdottir M., Vajda V., Fabrikant D. , Seyfullah L.J. (2024) *Parallel evolution of angiosperm-like venation in Peltaspermales: a reinvestigation of Furcula*, New Phytologist, in press .
6. Ulrich S., Vieira M., **Coiro M.**, Bouchal J.M., Geier C., Jacob B.F., Currano E.D., Lenz O.K., Wilde V., Zetter R., Grimsson F. (2024) *Origin and early evolution of Hydrocharitaceae and the ancestral role of Stratiotes*, Plants,13, 1008.
7. **Coiro M.*** (2024) *Embracing uncertainty: The way forward in plant fossil phylogenetics*, American Journal of Botany, 111:e16282.
8. **Coiro M.***, Allio R., Mazet N., Seyfullah L.J., Condamine F.L., (2023) *Reconciling fossils with phylogenies reveals the origin and macroevolutionary processes explaining the global cycad biodiversity*, New Phytologist, 240:1616-1635.
9. Seyfullah L.J., **Coiro M.**, Hoffmann C.C., (2023) *In situ pollen diversity in the relict conifer Wollemia nobilis*, Review of Palaeobotany and Palynology, 309: 104816.
10. Denk T., Bouchal J.M., Gruner H.T., **Coiro M.**, Butzmann R., Pigg K.B., Tiffney B.H., (2023) *Cenozoic migration of a desert plant lineage across the North Atlantic*, New Phytologist, 238: 2668-2684.
11. **Coiro M.***, Roberts E.A., Hoffmann C.C., Seyfullah L.J. (2022) *Cutting the long branches: consilience as a path to unearth the evolutionary history of Gnetales*, Frontiers in Ecology and Evolution, 1219.
12. Mellado-Mansilla D., Testo W., Sundue M. A., Zotz G., Kreft H., **Coiro M.**, Kessler M. (2022) *The relationship between chlorophyllous spores and mycorrhizal associations in ferns: Evidence from an evolutionary approach*, American Journal of Botany, 109: 2068–2081.
13. Glos R.A.E., Salzman S., Calonje M., Vovides A.P., **Coiro M.**, Gandolfo M.A., Specht C.D. (2022) *Leaflet Anatomical Diversity in Zamia (Cycadales: Zamiaceae) Shows Little Correlation with Phylogeny and Climate.*, The Botanical Review, 88: 437–452.
14. Vieira V., Zetter R., **Coiro M.**, Grimsson F. (2022) *Pliocene Lythrum (loosestrife, Lythraceae) pollen from Portugal and the Neogene establishment of European lineages.*, Review of Palaeobotany and Palynology, 296: 104548.
15. **Coiro M.***, Barone Lumaga M.R., Rudall P.J. (2021) *Stomatal development in the cycad family Zamiaceae.*, Annals of Botany, 128(5): 577-588.
16. Sampaio Mayer J.L., Scopece G., Barone Lumaga M.R., **Coiro M.**, Pinheiro F., Cozzolino S. (2021) *Ecological and phylogenetic constraints determine the stage of anthetic ovule development in orchids.*, American Journal of Botany, 108(12): 2405-2415.
17. Steinhorsdottir M., Elliot-Kingston C., **Coiro M.**, McElwain J.C. (2021) *Searching for a nearest living equivalent for Bennettitales: a promising extinct plant group for stomatal proxy reconstructions of Mesozoic pCO₂.*, GFF,1-2.
18. Grimsson F., Ulrich S., **Coiro M.**, Graham S.A., Jacob B.F., Currano E.D., Xafis A., Zetter R. (2021) *Hagenia from the early Miocene of Ethiopia: Evidence for possible niche evolution?*, Ecology and Evolution,11(10): 5164–5186.
19. Vovides A.P., Guevara R., **Coiro M.**, Galicia S., Iglesias C. (2021) *Pollen morphology of the Megamexican cycads reveals the potential of morphometrics to identify cycad genera.*, Botanical Sciences,99(1): 182-1970.
20. Koutroumpa K., Warren B.H., Theodoridis S.,**Coiro M.**, Romeiras M.M., Jiménez A., Conti E. (2021) *Geo-Climatic Changes and Apomixis as Major Drivers of Diversification in the Mediterranean Sea Lavenders (Limonium Mill.)*, Frontiers in Plant Science,11: 612258.
21. **Coiro M.***, Martinez L.C.A., Upchurch G., Doyle J.A. (2020) *Evidence for an extinct lineage of angiosperms from*

- the Early Cretaceous of Patagonia and implications for the early radiation of flowering plants., *New Phytologist*, 228(1): 344-360.
22. **Coiro M.***, Jelmini N., Neuenschwander H., Calonje M.A., Vovides A.P., Mickle J.E., Barone Lumaga M.R. (2020) *Evolutionary signal of leaflet anatomy in the Zamiaceae*, *International Journal of Plant Sciences*, 181(7):697–715.
 23. **Coiro M.***, Doyle J.A., Hilton J. (2019) *How deep is the conflict between molecular and fossil evidence on the age of the angiosperms?*, *New Phytologist*, 223(1): 83-990.
 24. Karasev E., Forte G., **Coiro M.**, Kustatscher E. (2019) *Mutoviaspermum krassilovii gen. et sp. nov.: A Peculiar Compound Ovuliferous Conifer Cone from the Lopingian (Late Permian) of European Russia (Vologda Region)*, *International Journal of Plant Sciences*, 180(8): 779-799.
 25. Erdei B., **Coiro M.**, Miller I., Johnson K.R., Griffith P.M., Murphy V. (2019) *First cycad seedling foliage from the fossil record and inferences for the Cenozoic evolution of cycads.*, *Biology letters*, 15(7): 20190114.
 26. Grimsson F., Graham S.A., **Coiro M.**, Jacobs B.F., Xafis A., Neumann F.H., Scott L., Sakala J., Currano E.D., Zetter R. (2019) *Origin and divergence of Afro-Indian Picrodendraceae: linking pollen morphology, dispersal modes, fossil records, molecular dating and paleogeography.*, *Grana* 58(4): 227-275.
 27. Thalmann M., **Coiro M.**, Meier T., Wicker T., Zeeman S.C., Santelia D. (2019) *The evolution of functional complexity within the -amylase gene family in land plants.*, *BMC Evolutionary Biology*, 19(1): 66.
 28. Calonje M., Meerow A., Griffith P., Salas-Leiva D., Vovides A., **Coiro M.**, Francisco-Ortega J. (2019) *A time-calibrated species tree phylogeny of the New World cycad genus Zamia L. (Zamiaceae, Cycadales).*, *International Journal of Plant Sciences*, 180(4): 286-314.
 29. Ehlig M., **Coiro M.**, Linder H.P. (2019) *Ecophysiological strategy switch through development in heteroblastic species of mediterranean ecosystems—an example in the African Restionaceae.*, *Annals of Botany*, 123(4): 611-623.
 30. **Coiro M.***, Barone Lumaga M.R. (2018) *Disentangling historical signal and pollinator selection on the micro-morphology of flowers: an example from the floral epidermis of the Nymphaeaceae.*, *Plant Biology*, 20 (5): 902-915.
 31. **Coiro M.***, Chomicki G., Doyle J.A. (2018) *Experimental signal dissection and method sensitivity analyses reaffirm the potential of fossils and morphology in the resolution of the relationship of angiosperms and Gnetales.*, *Paleobiology*, 44 (3): 490-510.
 32. **Coiro M.***, Pott C. (2017) *Eobowenia gen.nov. from the Early Cretaceous of Patagonia: indication for an early divergence of Bowenia?*, *BMC Evolutionary Biology* 17 (1): 97.
 33. Feike D., Seung D., Graf A., Bischof S., Ellick T., **Coiro M.**, Soyk S., Eicke S., Mettler-Altmann T., Lu K.J., Trick M., Zeeman S.C., Smith A.M. (2016) *A novel starch-granule-associated protein required for the control of starch degradation in Arabidopsis thaliana leaves.* *The Plant Cell*, 28: 1472-1489.
 34. Barone Lumaga M.R., **Coiro M.***, Truernit E., Erdei B., De Luca P. (2015) *Epidermal micromorphology in Dioon: did volcanism constrain Dioon evolution?*, *Botanical Journal of the Linnean Society*, 179: 236–254.
 35. Seung D., Soyk S., **Coiro M.**, Maier B.A., Eicke S., Zeeman S.C. (2015) *PROTEIN TARGETING TO STARCH Is Required for Localising GRANULE-BOUND STARCH SYNTHASE to Starch Granules and for Normal Amylose Synthesis in Arabidopsis*, *Plos Biology*, 13(2).
 36. Chomicki G., Bidel L.P.R., Ming F., **Coiro M.**, Zhang X., Wang Y., Baissac Y., Jay-Allemand C., Renner S.S., (2015) *The velamen protects photosynthetic orchid roots against UV-B damage, and a large dated phylogeny implies multiple gains and losses of this function during the Cenozoic*, *New Phytologist*, 205(3): 1330-1341.
 37. **Coiro M.**, Barone Lumaga M.R., (2013) *Aperture evolution in Nymphaeaceae: insights from an ultrastructural and micromorphological investigation*, *Grana*, 52(3): 192-201.

Preprints

38. Budd G.E., Mann R.P., Doyle J.A., **Coiro M.**, Hilton J. (2021) *Fossil data do not support a long Pre-Cretaceous history of flowering plants*, *BioRxiv*, 431478
39. Klopstein S., Ryser R., **Coiro M.**, Spasejovic T. (2019) *Mismatch of the morphology model is mostly unproblematic in total-evidence dating: insights from an extensive simulation study.*, *BioRxiv*, 679084

Book chapters

40. **Coiro M.**, Truernit E. (2017) *Modified pseudo-Schiff propidium iodide staining for xylem characterization using confocal laser-scanning microscopy on whole-mount samples*, in Lucas and Etchells(eds.) *Xylem*, *Methods in Molecular Biology*, Springer

Reports

41. Antonelli A., Fry C., Smith R. J., Eden J., Govaerts R. H. A., Kersey P., Nic Lughadha E., Onstein R. E., Simmonds M. S. J., Zizka A., Ackerman J. D., Adams V. M., Ainsworth A. M., Albouy C., Allen A. P., Allen S.

- P., Allio R., Auld T. D., Bachman S. P., Baker W. J., Barrett R. L., Beaulieu J. M., Bellot S., Black N., Boehnisch G., Bogarín D., Boyko J. D., Brown M. J. M., Budden A., Bureš P., Butt N., Cabral A., Cai L., Aguilar-Cano J., Chang Y., Charitonidou M., Chau J. H., Cheek M., Chomicki G., **Coiro M.**, Colli-Silva M., Condamine F. L., Crayn D. M., Cribb P., Cuervo-Robayo A. P., Dahlberg A., Deklerck V., Denelle P., Dhanjal-Adams K. L., Druzhinina I., Eiserhardt W. L., Elliott T. L., Enquist B. J., Escudero M., Espinosa-Ruiz S., Fay M. F., Fernández M., Flanagan N. S., Forest F., Fowler R. M., Freiberg M., Gallagher R. V., Gaya E., Gehrke B., Gelwick K., Grace O. M., Granados Mendoza C., Grenié M., Groom Q. J., Hackel J., Hagen E. R., Hágsater E., Halley J. M., Hu A.-Q., Jaramillo C., Kattge J., Keith D. A., Kirk P., Kissling W. D., Knapp S., Kreft H., Kuhnhäuser B. G., Larridon I., Leão T. C. C., Leitch I. J., Liimatainen K., Lim J. Y., Lucas E., Lücking R., Luján M., Luo, Magallón S., Maitner B., Márquez-Corro J. I., Martín-Bravo S., Martins-Cunha K., Mashau A. C., Mauad A. V., Maurin O., Medina Lemos R., Merow C., Michelangeli F. A., Mifsud J. C. O., Mikryukov V., Moat J., Monro A. K., Muasya A. M., Mueller G. M., Muellner-Riehl A. N., Nargar K., Negrão R., Nicolson N., Niskanen T., Oliveira Andriano C., Olmstead R. G., Ondo I., Osés L., Parra-Sánchez E., Paton A. J., Pellicer J., Pellissier L., Pennington T. D., Pérez-Escobar O. A., Phillips C., Pironon S., Possingham H., Prance G., Przelomska N. A. S., Ramírez-Barahona S. A., Renner S. S., Rincon M., Rivers M. C., Rojas Andrés B. M., Romero-Soler K. J., Roque N., Rzedowski J., Sanmartín I., Santamaría-Aguilar D., Schellenberger Costa D., Serpell E., Seyfullah L. J., Shah T., Shen X., Silvestro D., Simpson D. A., Šmarda P., Šmerda J., Smidt E., Smith S. A., Solano-Gomez R., Sothers C., Soto Gomez M., Spalink D., Sperotto P., Sun M., Suz L. M., Svenning J.-C., Taylor A., Tedersoo L., Tietje M., Trekels M., Tremblay R. L., Turner R., Vasconcelos T., Veselý P., Villanueva B. S., Villaverde T., Vorontsova M. S., Walker B. E., Wang Z., Watson M., Weigelt P., Wenk E. H., Westrip J. R. S., Wilkinson T., Willett S. D., Wilson K. L., Winter M., Wirth C., Wölke F. J. R., Wright I. J., Zedek F., Zhigila D. A., Zimmermann N. E., Zuluaga A., Zuntini A. R. (2023) *State of the World's Plants and Fungi, 2023*. Research report; Royal Botanic Gardens, Kew: Kew, UK, 2023. <https://doi.org/10.34885/wwn-6s63>.
42. Bacher S., Galil B. S., Nuñez M. A., Ansong M., Cassey P., Dehnen-Schmutz K., Fayvush G., Hiremath A. J., Ikegami M., Martinou A. F., McDermott S. M., Preda C., Vilà M., Weyl O. L. F., Fernandez R. D., Ryan-Colton E. (*Lead Authors*); Alexander M.E., Andrade C., Angelidou I., Ardanaz D., Athanasiou K., Atkore V., Barney J., Baxter-Gilbert J., Beckmann B., Bellard C., Blackburn T.M., Blanchet E., Boser C.L., Boyes D.H., Bockerhoff E.G., Buchter S., Canpaña M., Carbutt C., Carisio L., Castro-Díez P., Cavadino I., Céspedes V., Cheseaux J., Chown S.L., Christopoulou A., Cisneros-Heredia D.F., Coetzee J.A., **Coiro M.**, Cooling M., Courchamp F., Coutts S.R., Crego R.D., De Groot M., Demetriou J., Diagne C., Dickey J.W.E., Downs C.T., Duboscq V., Early R., Ellender B.R., Ens E., Espinosa-Torres P.M., Evans T., Flores-Males P.T., Fofonoff P., Gallardo B., Gruber M.A.M., Hagen B., Harris M., Hoffmann B.D., Hui C., Ivey P., Jacobs L.K., Jeschke J.M., Joelson N.Z., Khan Mohd A., Koese B., Kumschick S., Lach L., Lapin K., Le Roux J.J., Leihy R.I., Lema D., Leroy B., Lester P.J., Lioy S., Liu C., MacMullen Z.J., Marr S.M., Mazzitelli M.A., Measey J., Medina M., Michel B., Mrugała A., Musseau C.L., Nahrung H.F., Neelavar Ananthram A., Núñez León M., Pauchard A., Pazmino C., Pepori A., Pertierra L.R., Pienaar E.F., Prakash M.N., Ricciardi A., Rivas-Torres G., Roberts G.K., Rojas Martinez H.A., Rojas-Sandoval J., Ruiz G.M., Rusconi M., Russell S., Ryan-Schofield N.L., Sánchez R.M., Santini A., Santoro D., Scalera R., Schmidt L., Sheppard A.W., Shivambu N., Shivambu T.C., Sohrabi S., Stammers B., Stoett P., Straffon S., Tambo J.A., Tekiela D.R., Tricarico E., Trillo A., Turbelin A.J., van 't Hof P., Volery L., Wagener C., Wasserman R., Zengeya T.A., Zinnert L. (*Contributing Authors*) (2023) *IPBES Invasive Alien Species Assessment: Chapter 4. Impacts of invasive alien species on nature, nature's contributions to people, and good quality of life*. In: Thematic Assessment Report on Invasive Alien Species and their Control of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Roy H. E., Pauchard A., Stoett P., Renard Truong T. (eds.). IPBES secretariat, Bonn, Germany. <https://doi.org/10.5281/zenodo.7430731>

Datasets

43. Bacher S., Galil B. S., Nuñez M. A., Ansong M., Cassey P., Dehnen-Schmutz K., Fayvush G., Hiremath A. J., Ikegami M., Martinou A. F., McDermott S. M., Preda C., Vilà M., Weyl O. L. F., Fernandez R. D., Ryan-Colton E. (*Lead Authors*); Bacher S., Cassey P., **Coiro M.** (*Data Curators*) (2021) *IPBES Invasive Alien Species Assessment, database for Chapter 4. Impact Evidence Database (Version 1) [Data set]*. Zenodo. <https://doi.org/10.5281/zenodo.5706617>