Ruolin WU

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Education

University of Bristol Jun. 2021 – Current
School of Earth Sciences *Bristol, UK*
PhD of Palaeobiology

University of Science and Technology of China Sep. 2017 – Jun. 2020
Nanjing Institute of Geology and Palaeontology, CAS *Nanjing, China*
Master of Science in Paleontology and Stratigraphy

China University of Geosciences (Beijing) Sep. 2013 – Jul. 2017
School of Water Resources and Environment *Beijing, China*
Bachelor of Engineering in Hydrology and Water Resources Engineering

Research Experience

Doctoral Fellow Jun. 2021 – Present
School of Earth Sciences, University of Bristol *Bristol, UK*

- **Origin of angiosperms: quantitative integration of fossil records and the molecular clock**
  Developed a novel approach utilizing the Bayesian Brownian Bridge (BBB) model to generate fossil calibrations from extensive datasets for molecular clock analysis. Applied this method to study angiosperm evolutionary history, providing new insights into the timing of their origin and early diversification.

- **The timescale of eukaryote evolution estimated from Bayesian modelling of the fossil record**
  Adapted the BBB model to handle diverse input data formats, utilizing the most comprehensive and up-to-date dataset of early eukaryote fossils. Allowing for more accurate molecular clock calibrations and providing valuable insights into the timing and early evolution of eukaryotes.

Honorary Research Associate Oct. 2020 – Jun. 2021
School of Earth Sciences, University of Bristol *Bristol, UK*

- **The phylogenetic relationship of panarthropods**
  Analyzed the contested relationships among Onychophora, Tardigrada, and Euarthropoda using a range of phylogenetic inference methods. Demonstrated that morphological data alone cannot statistically resolve the relationships between these phyla, raising questions about the reliability of morphology-based phylogenies, especially those incorporating fossil species.

Graduate Research Fellow Sep. 2017 – Jun. 2020
Nanjing Institute of Geology and Palaeonotology, CAS *Nanjing, China*
University of Science and Technology of China

- **The origin and early evolution of algae fossils in Neoproterozoic**
  Incorporated advanced imaging and spectroscopic techniques to analyze high-fidelity multicellular red algae fossils from the Weng'an Biota. This research uncovered new insights into the development and reproductive mechanisms of early red algae, providing key evidence for understanding the early evolution of multicellularity in this group.

- **Quantitative analyses on the morphological and taxonomic diversity from Cambrian biota**
  Developed an integrated research approach combining multiple techniques from microscopy to microspectroscopy for studying exceptionally preserved Cambrian fossils. This approach overcame traditional limitations, enabling both structural and chemical analyses to better understand fossil preservation mechanisms and burial conditions.

Publications

1. Sun H, Zhao F, **Wu R**, Zeng H, Sun Z. **2024**. Spatiotemporal distribution and morphological diversity of the Cambrian Wiwaxia: New insights from South China. *Global and Planetary Change*, 239(2024).

2. **Wu R**, Pisani D, Donoghue PCJ. **2023**. The unbearable uncertainty of panarthropod relationships. *Biology Letters*, 19:20220497.

3. Miao Y, Yin Z, **Wu R**, Li G, Zhu M. **2021**. Microstructures and in-situ spectroscopic analyses of Conotheca (Orthothecide) from the early Cambrian Kuanchuanpu Biota. (in Chinese with English abstract). *Acta Palaeontologica Sinica*, 60(1):108-123.

4. **Wu R**, Wu S, Yin Z. **2019**. Imaging phosphatized microfossils from the edicaran Weng'an Biota using confocal laser scanning microscopy (in Chinese with English abstract). *Acta Palaeontologica Sinica*, 58(1):130-140.

5. Wu S, Yin Z, Sun W, Zhao D, **Wu R**. **2018**. High-resolution tomography of millimeter-to-centimeter-sized fossils using three-dimensional x-ray microscopy (in Chinese with English abstract). *Acta Palaeontologica Sinica*, 57(2):157-167.

Awards and Scholarships

The Palaeontological Association Student Travel Grant | *The Palaeontological Association* Sep. 2023
- Travel award that was used to cover travel expenses to attend the 2023 annual meeting in Cambridge.

The University of Bristol Bob Savage Funding Award | *University of Bristol* Jun. 2023
- Award that was used to cover travel expenses to visit Dr Daniele Silvestro's lab at the University of Fribourg in Switzerland, developing the new Bayesian Brownian Bridge method.

Chinese Government Scholarship | *China Scholarship Council* Jul. 2020
- Scholarship that sponsors the four-year PhD program at the University of Bristol.

Outstanding Graduates Award | *University of Science and Technology of China* May. 2020

Second Prize for Best Oral Presentation | *Nanjing Institute of Geology and Palaeonotology, CAS* Nov. 2017
- Fieldwork Internship in the Yichang Region, China

Outstanding Student Award | *Nanjing Institute of Geology and Palaeonotology, CAS* Nov. 2017
- Fieldwork Internship in the Yichang Region, China

Second-Class Scholarship | *University of Science and Technology of China* Sep. 2017

Teaching experience and academic outreach

Meeting Host - Bristol Palaeobiology Discussion Group Meeting Series | *UoB* 2024 - 2025
- Hosted the Meeting Series

Meeting Host - The Molecular Paleobiology Lab Group Meeting Series | *UoB* 2022 - 2023
- Monitored and hosted the Meeting Series

Lecture Demonstrator/Teaching Assistant | *UoB* 2020 - 2023
- Supervised and guided students in practical classes for 4 modules, including Geobiology, Phylogenetic methods in Paleobiology, Geology, and Environmental Geosciences
- Demonstrate the Lectures using basic coding languages such as R and Python; troubleshooting the use of phylogenetic methods, including iqtree, MyBayes, PAUP, etc.

Fieldwork Assistant | *UoB* 2022
- Co-ordinated the Year-3 Undergraduate fieldwork teaching in Jurassic Coast, Lyme Regis

Conference Talk and Poster

2024 Origin of angiosperms: quantitative integration of fossil records and the molecular clock, *Mathematical and Statistical Aspects of Molecular Biology Meeting*, London, UK | Talk

2023 Estimating the origin of angiosperms based on quantitative analysis of the fossil record and the molecular clock, *The 67th Palaeontological Association Annual Meeting*, Cambridge, UK | Talk

2021 The unbearable uncertainty of panarthropod relationships, *The 65th Palaeontological Association Annual Meeting*, Manchester, UK | Poster

2018 Rod-shaped red algae with cellular differentiation and holdfasts from the Ediacaran Weng'an Biota, *The 2018 Annual Academic Conference of the Subcommission on Fossil Invertebrates, The Palaeontological Society of China*, Zhengzhou, China | Talk

2018 High-resolution synchrotron tomographic reconstruction of a complex benthic algal thallus from the Ediacaran Weng'an biota, *International Conference on Ediacaran and Cambrian Sciences Joint Meeting of Ediacaran and Cambrian Subcommissions*, Xi'an, China | Poster

2017 Application of Laser Confocal Microscopy in the Weng'an Biota, *The 2017 Annual Academic Conference of the Subcommission on Fossil Invertebrates, The Palaeontological Society of China*, Nanjing, China | Talk

2017 Application of Laser Scanning Confocal Microscope in Observing Microfossils from the Ediacaran Weng'an Biota, *The Second Joint Conference of the Palaeontological Society of China and Palaeontologische Gesellschaft*, Yichang, China | Poster

Skills

Coding language: R, Python, Perl
Phylogentic software/programme: PAUP, TNT, iqtree, MrBayes, PAML
Language: English (professional proficiency); Chinese-Mandarin (native); Chinese-Cantonese (native); French (basic)