



# *PALAEONEWS*

## **NIGPAS Newsletter No.9**



**Dec 2019**

**Nanjing Institute of Geology and Palaeontology,  
Chinese Academy of Sciences**

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## HIGHLIGHTS

### **The 1st Asian Palaeontological Congress -with celebrations on the 90th Anniversary of the Palaeontological Society of China was held in Beijing**

In November 2019, the two-day First Asian Palaeontological Congress (APC) with celebrations on the 90th anniversary of the Palaeontological Society of China (PSC) was grandly held in the China Hall of Science and Technology in Beijing. The APC 2019 was organized by NIGPAS etc. with the topic of “Palaeontology of New Era in Asia: Collaboration and Innovation”. This congress exhibited the recent progresses achieved by a variety of topics of the palaeontological studies in Asia, and strengthen the collaborations and communications for palaeontological societies among Asian countries in the fields of scientific research, education, fossil protection and museum displays.



### **The newly established Asian Palaeontological Association is headquartered in Nanjing**

Palaeontologists from more than 18 countries in Asia participated in the first business meeting of the Asian Palaeontological Association (APA), and decided that the association's headquarters to be located permanently in Nanjing, China. Prof. ZHAN Renbin from NIGPAS was elected as its first President. The establishment of APA is quite important for giving full play to regional international academic influence, and will also help countries along the "Belt and Road" route to carry out international cooperation in scientific and technological innovation.

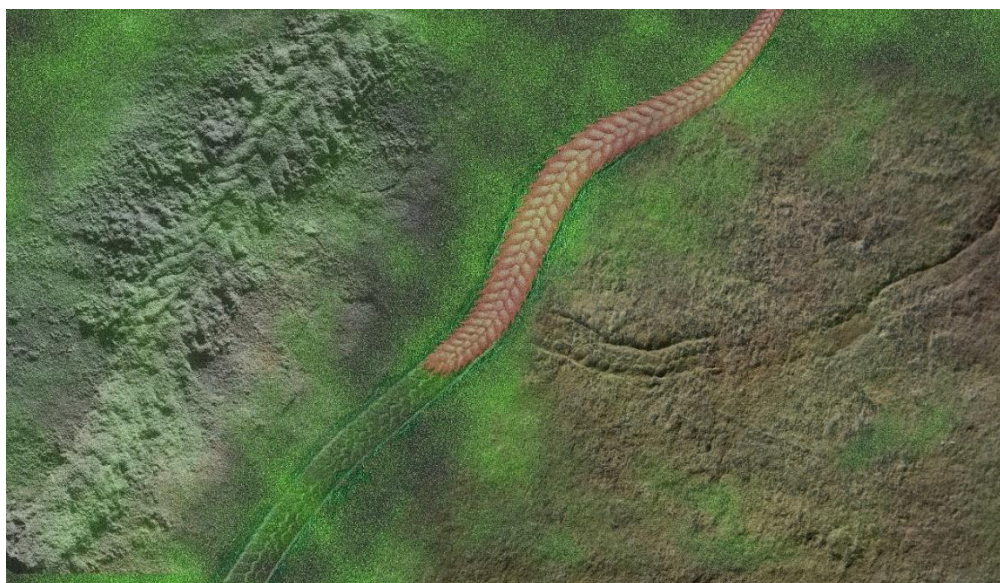


## New Ediacaran fossils elucidate early animal evolution

The origin of bilaterally symmetric animals with a segmented body plan is a monumental innovation in animal evolution. A research team, led by Prof. YUAN Xunlai from NIGPAS discovered a new segmented bilaterian fossil (*Yilingia spiciformis*) and extraordinary trace fossils, preserved in ~550-million-year-old rocks in the Yangtze Gorges area, Hubei Province. The newly found fossils unravel critical evolutionary puzzles and roll back the origin of segmented and bilaterally symmetrical animals by at least 10 million years. The trace fossils record complex behaviors and reflect short-term fluctuations of dissolved oxygen levels in the bottom sea water. The appearance of motile animals in the Ediacaran Period has profound environmental and ecological impacts on the Earth surface system and ultimately led to the Cambrian substrate and agronomic revolutions. The researches were published in *Nature* and *Geology* this year.

**Reference:** CHEN Zhe, ZHOU Chuanming, YUAN Xunlai\*, XIAO Shuhai\*. 2019. Death march of a segmented and trilobate bilaterian elucidates early animal evolution. *Nature* 573: 412-415. DOI: [10.1038/s41586-019-1522-7](https://doi.org/10.1038/s41586-019-1522-7).

XIAO Shuhai\*, CHEN Zhe, ZHOU Chuanming, YUAN Xunlai\*. 2019. Surfing in and on microbial mats: Oxygen-related behavior of a terminal Ediacaran bilaterian animal. *Geology* 47: 1054-1058. DOI: [10.1130/g46474.1](https://doi.org/10.1130/g46474.1).



Body fossil (right), trace fossil (left) and reconstruction (middle) of *Y. spiciformis*

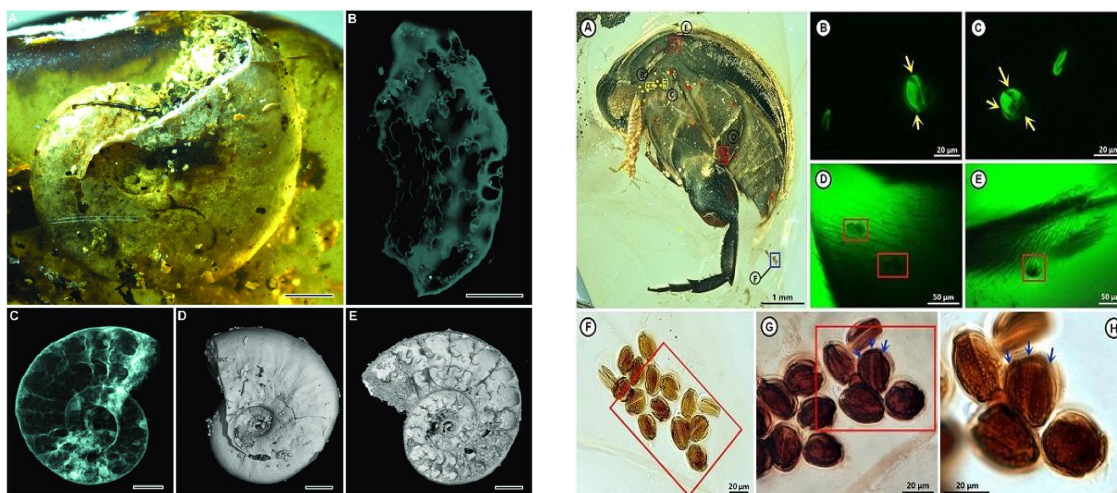


## Cretaceous Burmese amber reveals ancient forest environment and insect pollination of angiosperms

An international research group led by Prof. WANG Bo from NIGPAS reported an ammonite alongside a mixed assemblage of terrestrial organisms and a pollinating beetle respectively in mid-Cretaceous Burmese amber (100 million years old). The first discovery indicates that the Burmese amber forest was growing near a dynamic and shifting coastal environment. The amber ammonite also provides supporting evidence for the age of the amber, which is still debated, and represents a rare example of dating using fossils present inside the amber. The second discovery provides multiple lines of evidence, including pollen-feeding mouthparts, pollen-carrying hairs on the body, and zoophilous pollination attributes of the tricolpate pollen, which strongly supports a specialized beetle-angiosperm pollination mode. It shows early evidence of insect pollination of flowering plants and demonstrates that insect pollination of flowering plants existed already at least 100 million years ago.

**Reference:** YU Tingting, KELLY R., MU Lin, ROSS A., KENNEDY J., BROLY P., XIA Fangyuan, ZHANG Haichun, WANG Bo\*, DILCHER D.\* (2019) An ammonite trapped in Burmese amber. *PNAS*, 116: 11345–11350. DOI: [10.1073/pnas.1821292116](https://doi.org/10.1073/pnas.1821292116).

BAO Tong, WANG Bo\*, LI Jianguo, DILCHER D.\* (2019) Pollination of Cretaceous flowers. *PNAS*, 116: 24707–24711. DOI: [10.1073/pnas.1916186116](https://doi.org/10.1073/pnas.1916186116).



Ammonite *Puzosia* (*Bhimaites*) Matsumoto (right); the beetle and tricolpate pollen grains (left)

## The Early Ediacaran *Caveasphaera* Foreshadows the Evolutionary Origin of Animal-like Embryology

Animals evolved from single-celled ancestors, before diversifying into 30 or 40 distinct phyla. When and how animal ancestors made the transition from single-celled microbes to complex multicellular organisms has been the focus of intense debate for a long time. Until recently, this question could only be addressed by studying living animals and their relatives, but now an international research team led by Prof. YIN Zongjun from NIGPAS and Prof. Philip CJ Donoghue from University of Bristol has found evidence that a key step in this major evolutionary transition happened long before complex animals appear in the fossil record. The team investigated the fossils named *Caveasphaera* in 609 million-year old rocks in Guizhou Province of South China, using X-ray microtomography. The results show that *Caveasphaera* develops within an envelope by cell division, ingression, detachment, and polar aggregation in a manner analogous to gastrulation of animal embryos. Together with evidence of functional cell adhesion and development within an envelope, this is suggestive of a holozoan affinity. The discovery of gastrulation-like development occurring in an extinct Ediacaran holozoan suggests the evolutionary origin of animal-like embryology.

**Reference:** YIN Zongjun\*, K Vargas, J Cunningham, S Bengtson, ZHU Maoyan, F Marone, PCJ Donoghue\*. 2019. The early Ediacaran *Caveasphaera* foreshadows the evolutionary origin of animal-like embryology. *Current Biology*, 29: 4307-4314. [DOI: 10.1016/j.cub.2019.10.057](https://doi.org/10.1016/j.cub.2019.10.057).



Proposed life cycle of *Caveasphaera*

## INTERNATIONAL COLLABORATION

### NIGPAS signed the Cooperation Memorandums

On December 12, 2019, Prof. Igor Eltsov and Prof. Nikolay Sennikov from Institute of Petroleum Geology and Geophysics (IPGG) of the Russian Academy of Sciences in Novosibirsk, eastern Russia paid a visit to NIGPAS. During their visit, Eltsov (director of IPGG) and Director ZHAN Renbin of NIGPAS signed a Memorandum of Understanding (MOU) between two institutes to establish a formal academic link.

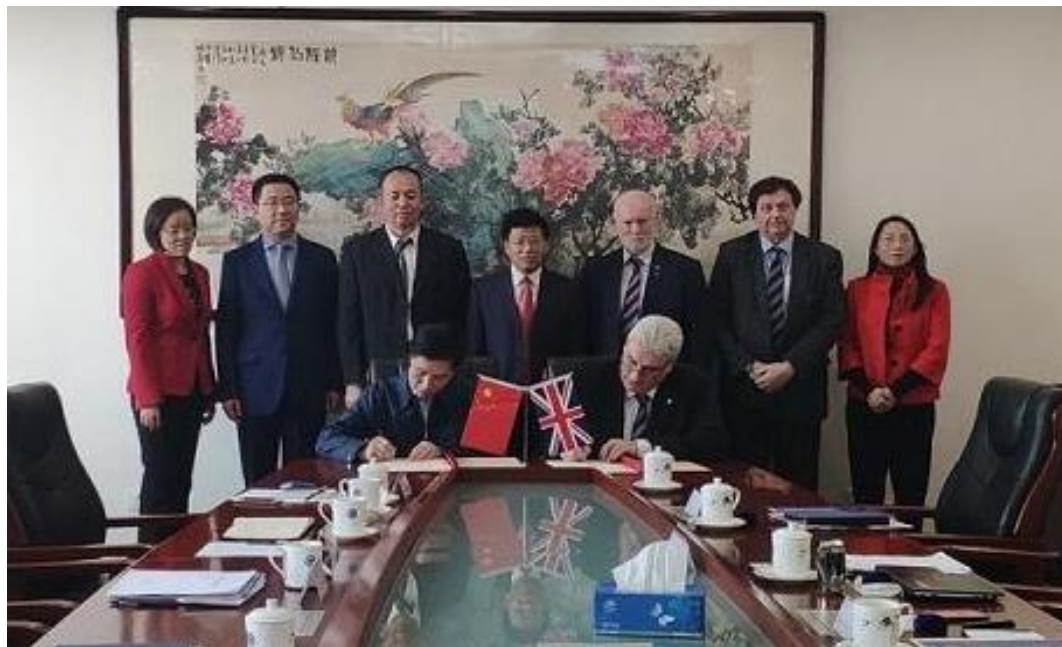


On November 19, 2019, the representatives of Mahasarakham University in Thailand and NIGPAS signed a MOU of cooperation in Beijing, to promote the future bilateral cooperation on research and education in the fields of mutual interest.





On March 1, 2019, NIGPAS and the Department of Geosciences, University of Durham signed an Agreement of Cultural, Educational and Scientific Cooperation under the witness of Prof. WANG Keqiang, the Secretary-General of the Chinese Academy of Sciences.



### **Scientists from NIGPAS carried out field work**

At the invitation of Director Muhammad Amjad Sabir from Institute of Information Technology of Pakistan's COMSATS, the Upper Paleozoic research team of NIGPAS carried out a field expedition in the Salt Range of Pakistan from March 11 to March 19, 2019. The excursion was supported by the local government and geologists throughout the whole process, which fully demonstrates the friendship between China and Pakistan.





## Scientists from NIGPAS participated in international conferences

On November 12, the 2019 International Conference on the Cambrian Explosion hosted by NIGPAS was held in Chengjiang, China. The Chengjiang biota, at the critical interval of the Cambrian explosion, had been discovered for 35 years since 1984. The purpose of this international symposium was to commemorate the 35<sup>th</sup> anniversary of the discovery of the Chengjiang biota, to exchange the latest research progress of the Cambrian explosion and to discuss future investigations.



During October 11-17, 2019, the First International Symposium of IGCP 679 project "Cretaceous Geodynamics and Asian Paleoclimate" hosted by NIGPAS was held in Qingdao, China.





From July 29 to August 2, 2019, the 19<sup>th</sup> International Conference on the Carboniferous and Permian was held in Cologne, Germany. A total of 15 people from NIGPAS attended the meeting and all presented their latest research progresses in their own fields.



During July 25-31, 2019, the 20<sup>th</sup> annual meeting of the International Union for Quaternary Research (INQUA) was held at the Dublin Convention Center in Ireland. Prof. WANG Weiming and 5 colleagues from NIGPAS were among the delegates.





During July 19-22, 2019, the 13<sup>th</sup> International Ordovician Conference was held in Novosibirsk, Russia. Prof. ZHAN Renbin and 8 colleagues from NIGPAS attended the meeting. All of them reported their academic research results of their own fields and participated in the field excursions affiliated with the conference.



During July 2-5, 2019, the 3<sup>rd</sup> International Stratigraphic Congress was held in Milan, Italy. The theme of this meeting focuses on the progress of stratigraphic research from Precambrian to Holocene. More than 500 experts and scholars from all over the world participated in this grand event. A total of 10 people from NIGPAS attended this meeting and gave oral reports respectively to introduce the latest scientific research progresses in their own fields.





During June 23-27, 2019, the 11<sup>th</sup> North American Paleontological Convention was held at the University of California, Riverside, with more than 600 experts and scholars from 34 countries attending. Prof. PENG Shanchi and other 9 people from NIGPAS attended the meeting and gave oral presentations respectively, which were widely recognized and positively evaluated by international counterparts.



During April 7-13, 2019, the 8<sup>th</sup> International Conference on Ancient Insects, Arthropods and Amber was held in Santo Domingo, the capital of the Dominican Republic. Seven people from NIGPAS participated in the activities of the International Society of Palaeoentomology (ISP) and this conference. Prof. HUANG Diying from NIGPAS was selected as an honorary member of ISP and received a recognition award from ISP. Prof. WANG Bo from NIGPAS was elected as the new vice-president of ISP. Marina Hakim, a PhD student of NIGPAS, won the only award for the best exhibition board and the winning prize at the conference.



**Seminars given by international scholars, January - December 2019**

<b>Dr. Cui Huan:</b> Primary or secondary: Reinterpreting carbon and sulfur isotope anomalies in Earth history	2019-4-1
<b>Prof. Ryosuke Motani:</b> Is there a missing Permian record for Mesozoic marine reptiles? — Bayesian and stratigraphic approaches	2019-4-3
<b>Prof. Andrea Tintori</b> The actinopterygian fishes across the P/T boundary	2019-4-3
<b>Dr. Dieter Korn:</b> Pre-mass extinction decline of latest Permian ammonoids	2019-4-9
<b>Prof. Dr. Joachim Reitner:</b> <b>Topic: Deep Carbon Archives</b> 1. Early carbonates (Archaean) 2. Critical review on early organic carbon record 3. Geobiology of Archaean barite: a new window to an early microbial world <b>Topic: The Metazoan conundrum</b> 1. Neoproterozoic microbial innovation 2. Critical review and new data on the Neoproterozoic record of sponges and possible ancestors 3. Namibian Ediacaran: a window to early metazoan biomineralization	2019-4-10 & 2019-4-11
<b>Associate Prof. Tais W. Dahl:</b> Atmosphere-ocean oxygenation and productivity dynamics during the Cambrian explosion	2019-5-9
<b>Prof. Dr. Gabriella Bagnoli:</b> Recommending the Xiaoyangqiao section in Dayangcha of North China as Auxiliary Stratotype Section and Point (ASSP) for the base of the Ordovician System	2019-5-15
<b>Associate prof. Joseph Botting &amp; Associate prof. Lucy Muir:</b> Sponges and the Cambrian Explosion: new evidence from the end-Ordovician Anji Biota of Zhejiang	2019-5-17
<b>Prof. Heyo Van Iten:</b> Revising the Treatise on Invertebrate Paleontology, and ecological relationships between conulariids and brachiopods	2019-5-22
<b>Prof. Thomas Servais:</b> Great Ordovician Biodiversification of land plants	2019-5-23

<b>Prof. Robert Riding:</b> Microbial Carbonates in Time and Space	2019-6-3
<b>Prof. Sachiko Agematsu:</b> Natural assemblage of <i>Hindeodus parvus</i> , the earliest Triassic conodont	2019-6-5
<b>Prof. Ethan L. Grossman &amp; Prof. Michael. M. Joachimski:</b> 1. Introduction and Proxies Introduction to Paleotemperature Proxies Introduction to Oxygen Isotopes Introduction to Clumped Isotopes and Other Paleothermometers 2. Samples, Methods, and Considerations Carbonates as paleotemperature archive Phosphates as paleotemperature archive Practical work/exercises 3. Deep-Time Paleotemperature Records Cenozoic (ELG) and Mesozoic temperature records Paleozoic temperature records Clumped isotopes and Paleozoic Temperatures	2019-6-17 to 2019-6-19
<b>Prof. Hugh Jenkyns:</b> 1. Cretaceous greenhouse climate and Oceanic Anoxic Event 2 (Cenomanian–Turonian) 2. Deposition of organic matter and Oceanic Anoxic Events 3. The Toarcian (T-OAE) and Aptian (OAE 1a) Oceanic Anoxic Events 4. Oceanic Anoxic Events: the lacustrine record 5. Redox-sensitive and chalcophilic elements and Oceanic Anoxic Events 6. Metal isotopes and Oceanic Anoxic Events 7. Sulphur and nitrogen isotopes and Oceanic Anoxic Events	2019-6-18 to 2019-6-20
<b>Dr. Christopher Cleal:</b> Vegetation dynamics in tropical wetlands - a Palaeozoic perspective	2019-6-17
<b>Prof. Jacques Laskar:</b> Astronomical solution for paleoclimate studies	2019-7-12
<b>Dr. Thomas Denk:</b> Current trends in Fagaceae (paleo) biogeography	2019-7-15
<b>Conrad C. Labandeira:</b> 1. A Review of What Kinds of Ecological and Evolutionary Questions Can be Answered by the Damage Guide 2. Mid Mesozoic Pollination Modes	2019-8-6
<b>Prof. Jacek Szwedo:</b> The evolution of arthropods	2019-8-13



<b>Alexander Pohle:</b> Diversity and palaeobiology of nautiloid cephalopods from the Devonian of the eastern Anti-Atlas (Morocco)	2019-8-23
<b>Prof. YIN Qing-Zhu:</b> Fossil meteorites, asteroid breakup, Ordovician timescale, and the butterfly effect to the GOBE	2019-8-28
<b>Prof. Jadoon Ishtiaq Ahmed Khantan</b> Distribution and role of Eocambrian evaporites in the Himalayan foreland in Pakis	2019-9-6
<b>Dr. Cedric Aria</b> A middle Cambrian arthropod with chelicerae and proto-book gills	2019-9-12
<b>Dr. Moriaki Yasuhara:</b> Deep-sea drilling perspective on paleobiology: "co-evolution" of paleoceanography, paleoecology and macroevolution <b>Dr. Yuanyuan Hong (Circle):</b> Baseline for ostracod-based northwestern Pacific and Indo-Pacific shallow-marine paleoenvironmental reconstructions: ecological modeling of species distributions <b>Dr. Yunshu Tian (Sky):</b> Shallow-marine responses to Paleocene-Eocene thermal maximum: evidence from ostracods	2019-10-8
<b>Prof. Robert Riding:</b> 1. Introduction to Microbial Carbonates 2. Microbial carbonates in an Archean oxygen oasis 3. Proterozoic CO <sub>2</sub> -concentrating mechanisms (CCM) and cyanobacterial calcification 4. Phanerozoic Hybrid Carbonates: abiotic, microbial, skeletal 5. Microbial carbonates in Recent freshwater creeks 6. Recent agglutinated stromatolites: Andros, Shark Bay and Lee Stocking Island 7. Recent reef stromatolite crusts: Tahiti and Great Barrier Reef 8. Permeable Reactive Barriers: an experiment in carbonate precipitation 9. GEOCARB to COPSE: modeling Phanerozoic CO <sub>2</sub> 10. Calculating seawater carbonate saturation state for the Phanerozoic	2019-10-9 to 2019-10-12
<b>Dr. Ian G. Percival:</b> Geoconservation in action: some Australian examples from the Ediacaran and Ordovician	2019-10-15

<b>DR. Petr Schnabl &amp; Pavel Nemec</b> Paleomagnetism, Magnetostratigraphy and Orientation of Flying Dinosaurs by Geomagnetic Field	2019-10-15
<b>Prof. Tatsuo Oji :</b> 1. Introduction: Geography, geology and paleontology of Japan 2. Early evolution of Metazoa: Molecular and fossil evidence 3. Mass extinctions (periodicity, end Permian and end Cretaceous) 4. Mesozoic marine and terrestrial revolution 5. Biogeography and plate tectonics focusing on "Wallace Line" 6. Crinoids as a living fossil: their distribution, ecology and evolutionary history	2019-10-16 to 2019-10-18
<b>Petr Schnabl &amp; Pavel Nemec:</b> Paleomagnetism, Magnetostratigraphy and Orientation of Flying Dinosaurs by Geomagnetic Field	2019-10-24
<b>Prof. Else Marie Friis &amp; Prof. Kaj Raunsgaard Pedersen:</b> 1. Cretaceous angiosperms. 1) Early radiation and key mesofossil 2. Cretaceous angiosperms. 2) Ecological context	2019-11-11 & 2019-11-12
<b>Prof. Olle Hints:</b> An introduction to geology of Estonia and fossil polychaete jaws (scolecodonts) <b>Prof. Jaak Nolvak:</b> The Ordovician chitinozoans from Baltica	2019-11-12
<b>Associate prof. Noritoshi SUZUKI:</b> 1. Statistic paleontology (1) 2. Statistic paleontology (2) 3. Current knowledge of radiolarian studies	2019-11-13 to 2019-11-15
<b>Prof. David Harper:</b> 1.Stratigraphy: Defining and using geological time 2.Introduction to palaeoecology 3.Form and function in fossils 4.Origin, and overview, of Precambrian life 5.Biodiversity and extinction	2019-11-20 to 2019-11-26
<b>Prof. Wolfram M. Kürschner:</b> Linking Late Triassic marine and terrestrial ecosystems changes: a palynological approach <b>Dr. Micha Ruhl:</b> Linking Early Jurassic Global Change Events with Large Igneous Province volcanism	2019-12-5

<b>Director Igor Eltsov:</b> 1. The Trofimuk Institute of Petroleum Geology and Geophysics (overview) 2. Cross-Disciplinary Study of the Near Borehole Zone <b>Prof. Nikolay Sennikov:</b> The algae Euglenales in the Silurian of the Gorny Altai	2019-12-12
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## NEWS IN PICTURES

### Academic Activities with NIGPAS People

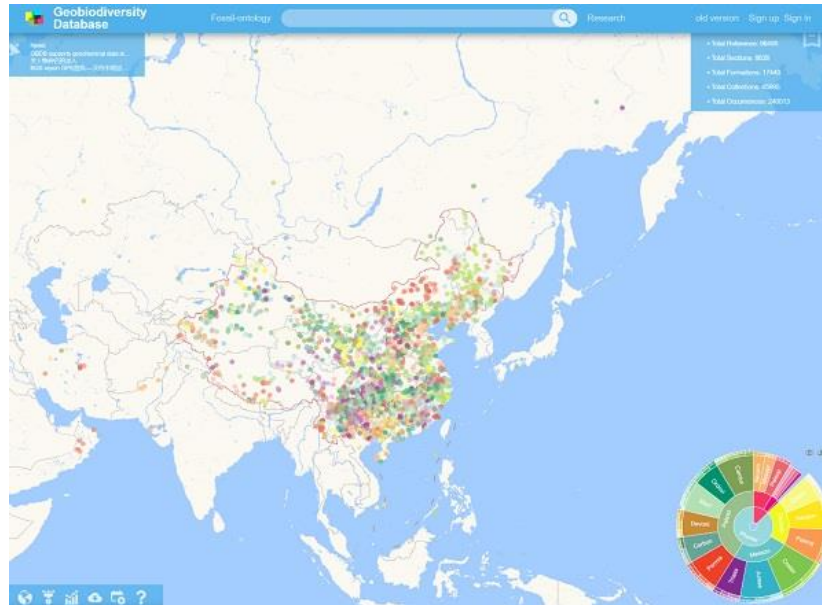
During October 11-13, 2019, the Palynological Branch of the Palaeontological Society of China (PSC) convened the Second Academic Meeting and Council Meeting of the Branch 10<sup>th</sup> Council in Mianyang, Sichuan, China, to fully demonstrate and summarize the research progresses in various fields of palynology in recent years, and to promote academic exchanges and subject development.



During September 20-23, 2019, the Second Academic Meeting of the Paleoinvertebrate Branch of PSC was held at the Northwest University in Xi'an.



After fully investigating the use of the GBDB database, systematically revised the website and back-end data, NIGPAS started the construction of the new version of GBDB since 2019. The new website has finally been launched (URL: <http://geobiodiversity.com/>), and the public beta has begun.



Two inventions completed by the *Experimental Paleobiology Laboratory* of NIGPAS were formally authorized. One was "High pressure simulator of environment exchangeable for rock-water reaction in wide range pressure controlling and its working process" and another was "High pressure vessel of media exchangeable with environment in wide pressure controlling and its working process".





## Education

On September 3, NIGPAS held the opening ceremony of the 2019 freshmen and the launching ceremony of entrance education. There are 17 candidates for Masters and 12 for PhD attended this meeting.



On June 27, 2019, the ceremony for the newly graduated students for Masters and PhDs from NIGPAS was held. This year, there are 24 graduate students including 10 PhD and 14 MSc got their degrees.



During November 1-9, 2019, a field teaching course organized by NIGPAS was conducted in the border region of Anhui, Zhejiang and Jiangxi provinces, East China. This year, besides 50 graduate students from NIGPAS, 9 senior undergraduates from 4 universities including Peking University, Nanjing University, Northwest University, and Lanzhou University participated in this teaching activity.



During July 8-12, the 4<sup>th</sup> Palaeontological Summer Camp for College Students with the theme “History Scrolls of Earth” was organized by NIGPAS. There were 26 undergraduates joined the camp.





In January, 20 students from the Earth Science Elite Class at Li Siguang College of China University of Geosciences (Wuhan) came to NIGPAS to exchange and study.



### Public outreach activities

On September 14, 2019, a series activities under the theme "National Science Popularization Day" was organized by NIGPAS. The Palaeontological Society of China (PSC) and the Nanjing Museum of Palaeontology launched the "90<sup>th</sup> Anniversary Special History Exhibition".





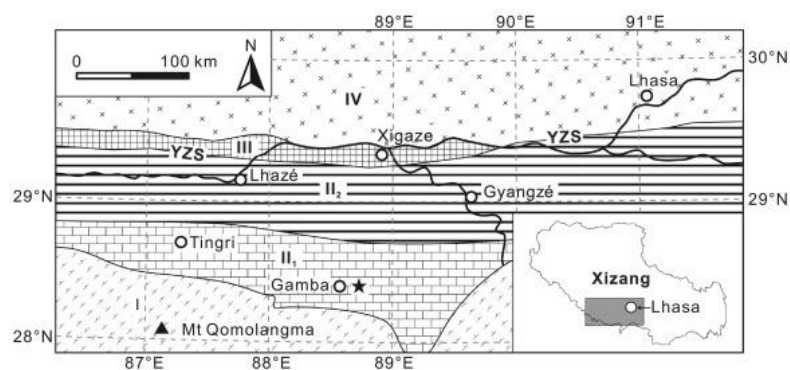
The "15<sup>th</sup> Public Science Day of the Chinese Academy of Sciences" was successfully held. NIGPAS won the Excellent Organization Award, and Nanjing Museum of Palaeontology was awarded the Advanced Collective of National Science Week Activities for 2019.



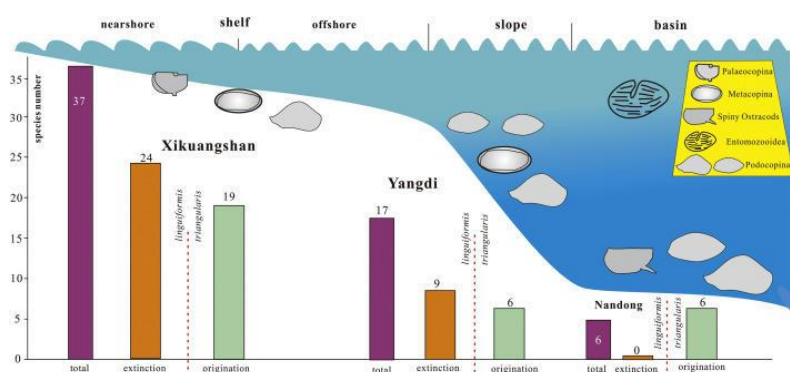
On March 21, 2019, a special fossil exhibition of plants and flowers entitled as "A World of Flowers" was organized by Nanjing Museum of Palaeontology. Nearly 80 specimens which reflect the evolution of plant reproductive organs were exhibited.



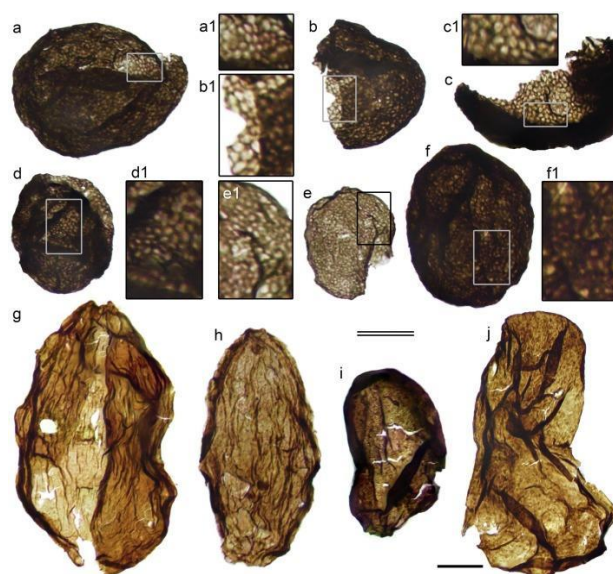
## Research Updates (till the end of Dec. 2020)



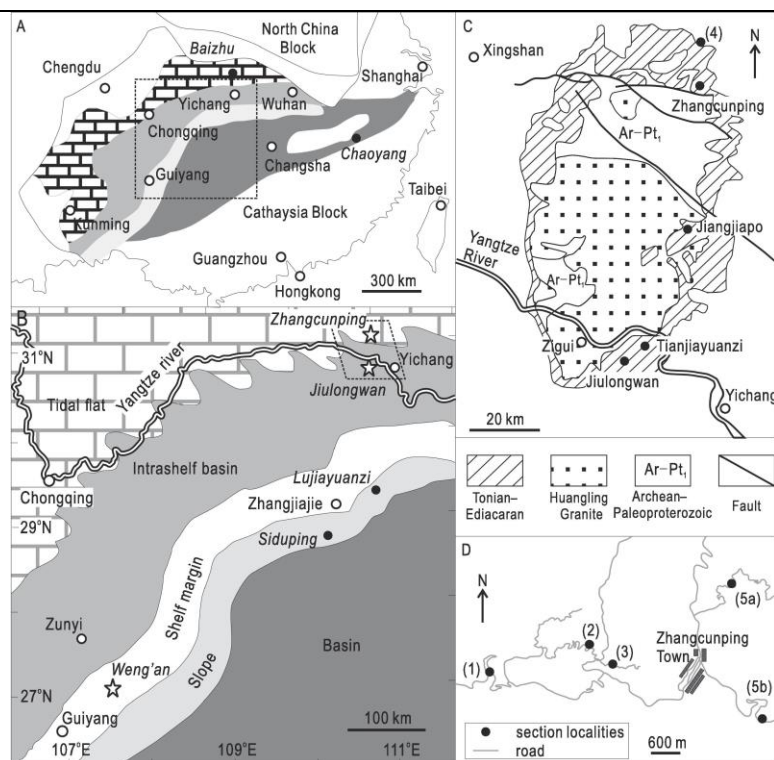
Palynofloral evolution on the northern margin of the Indian Plate, southern Xizang, China during the Cretaceous Period and its phytogeographic significance. (*Palaeogeography, Palaeoclimatology, Palaeoecology*. <http://dx.doi.org/10.1016/j.palaeo.2017.09.014>)



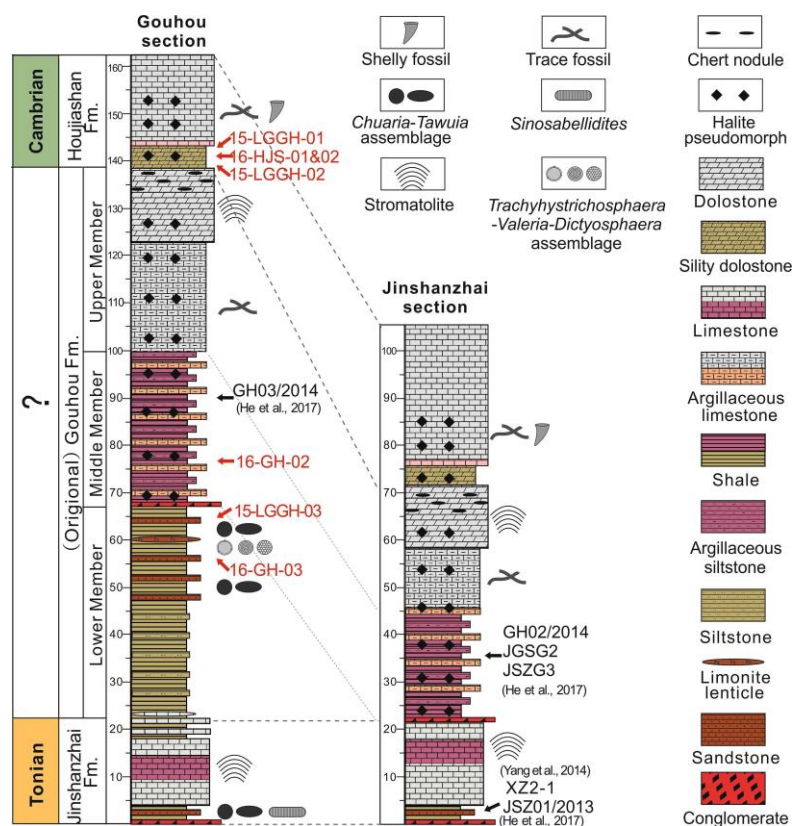
Response of Ostracods (Crustacea) to the Devonian F—F event: Evidence from the Yangdi and Nandong sections in Guangxi, South China. (*Global and Planetary Change*. <https://www.sciencedirect.com/science/article/pii/S0921818118303734>)



New record of organic-walled, morphologically distinct microfossils from the upper Paleoproterozoic Changcheng Group in the Yanshan Range, North China. (*Precambrian Research*. <http://dx.doi.org/10.1016/j.precamres.2018.11.019>)

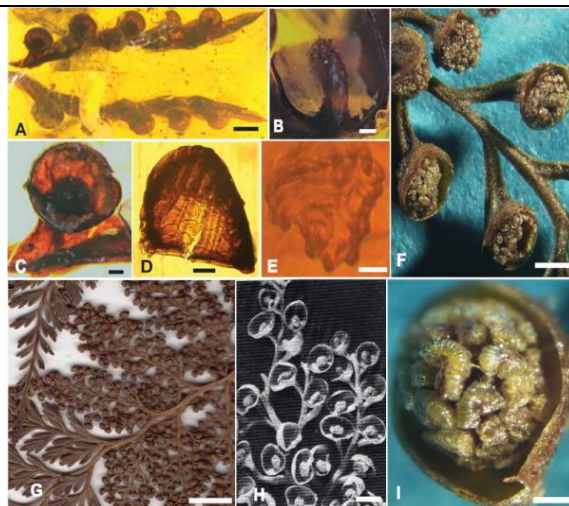


Acanthomorphic acritarchs from the Ediacaran Doushantuo Formation at Zhangcunping in South China, with implications for the evolution of early Ediacaran eukaryotes. (*Precambrian Research*. <https://doi.org/10.1016/j.precamres.2018.10.012>)

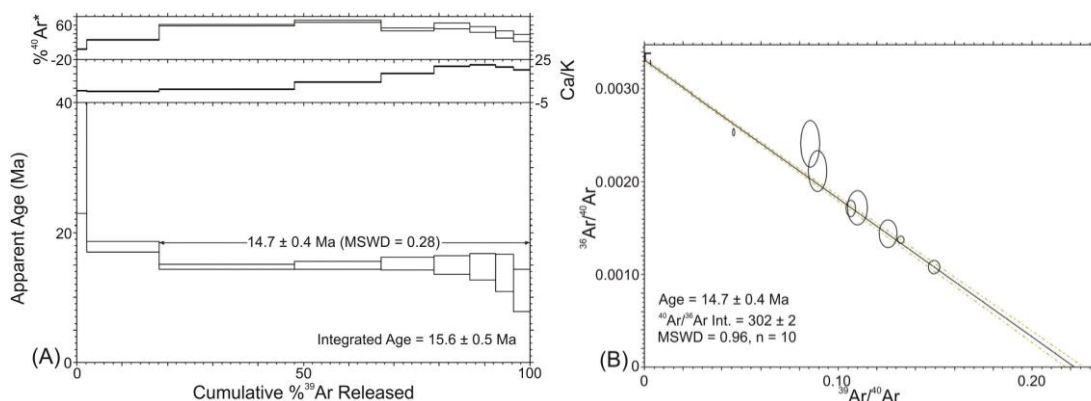


Repositioning the Great Unconformity at the southeastern margin of the North China Craton. (*Precambrian Research*. <https://doi.org/10.1016/j.precamres.2019.01.014>)

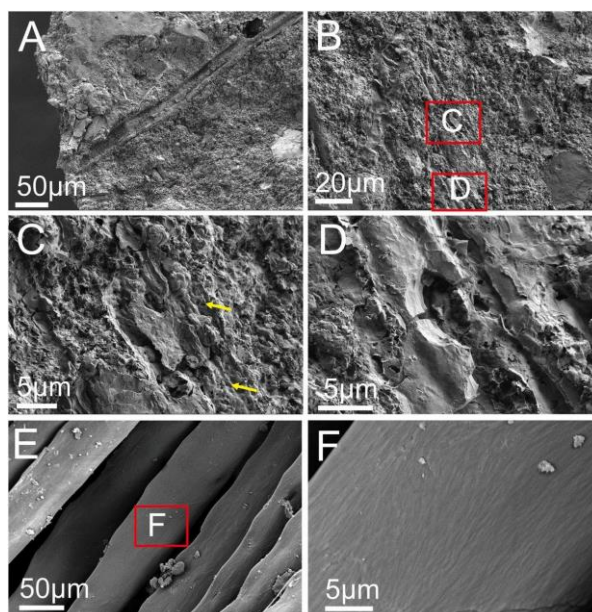




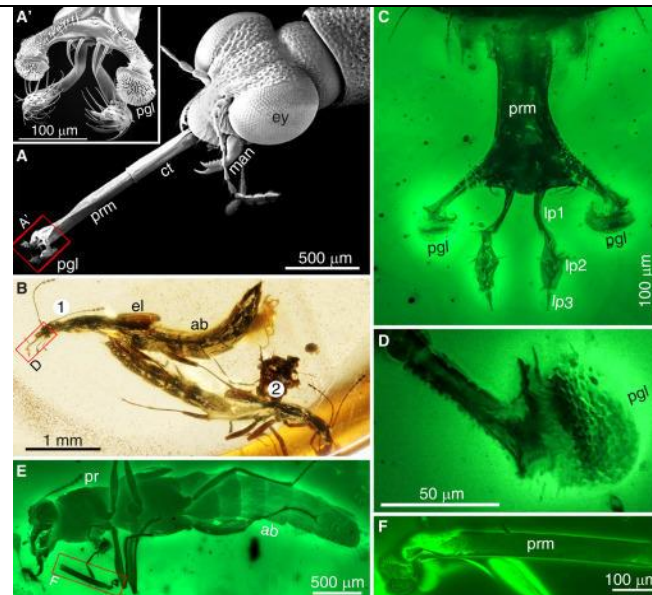
A mid-Cretaceous tree fern of Thyrsopteridaceae (Cyatheales) preserved in Myanmar amber. (*Cretaceous Research*. <https://doi.org/10.1016/j.cretres.2019.01.002>)



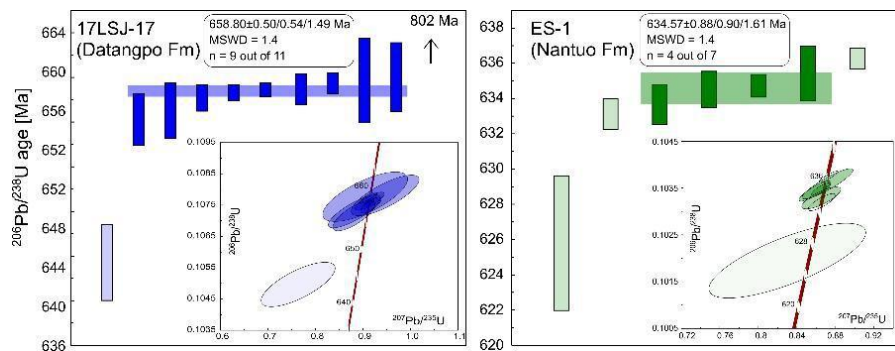
Age constraints on a Neogene tropical rainforest in China and its relation to the Middle Miocene Climatic Optimum. (*Palaeogeography, Palaeoclimatology, Palaeoecology*. <https://doi.org/10.1016/j.palaeo.2019.01.019>)



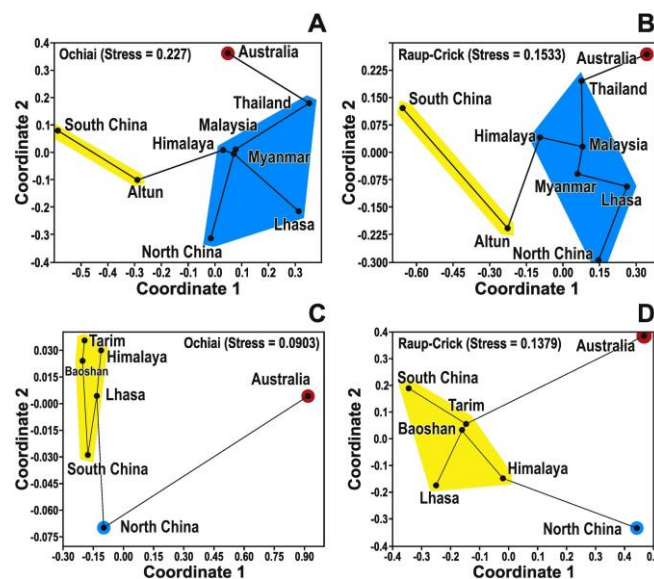
The molecular evolution of feathers with direct evidence from fossils. (*PNAS*. <http://doi.org/10.1073/pnas.1815703116>)



A specialized prey-capture apparatus in mid-Cretaceous rove beetles. (*Current Biology*. <https://doi.org/10.1016/j.cub.2019.01.002>)

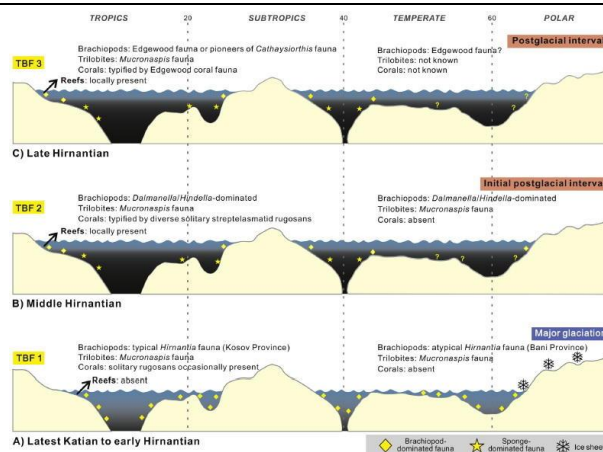


Calibrating the terminations of Cryogenian global glaciations. (*Geology*. <https://doi.org/10.1130/G45719.1>)

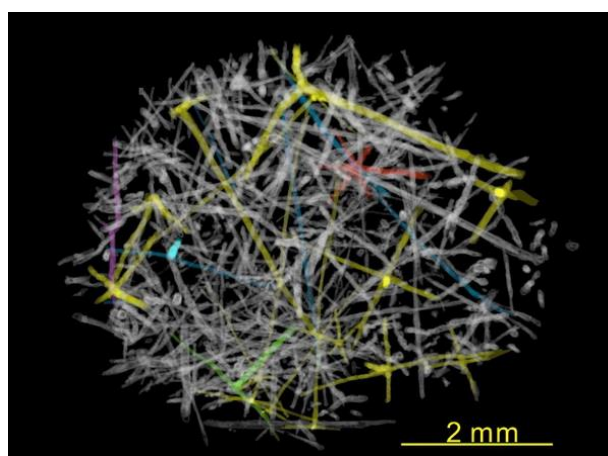


Dynamic variation of Middle to Late Ordovician cephalopod provincialism in the northeastern peri-Gondwana region and its implications. (*Palaeogeography, Palaeoclimatology, Palaeoecology*. <https://doi.org/10.1016/j.palaeo.2019.02.015>)

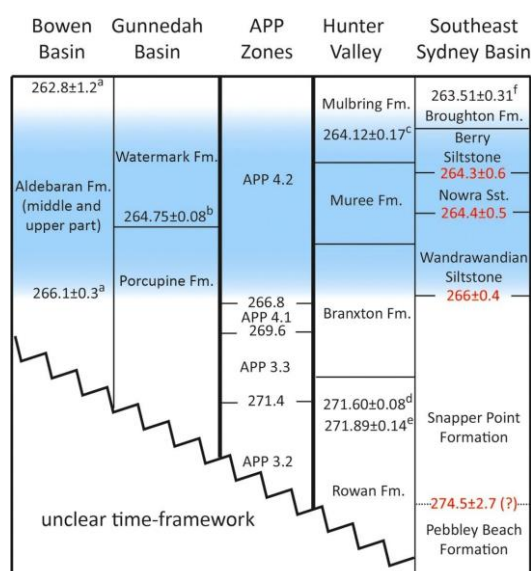




The end-Ordovician mass extinction: A single-pulse event? (*Earth-Science Reviews*, <https://doi.org/10.1016/j.earscirev.2019.01.023>)



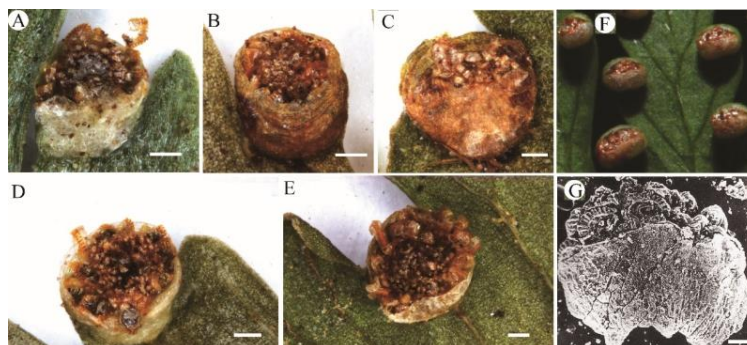
Three-dimensionally preserved stem-group hexactinellid sponge fossils from lower Cambrian (Stage 2) phosphorites of China. (*PalZ*, <https://doi.org/10.1007/s12542-018-00441-y>)



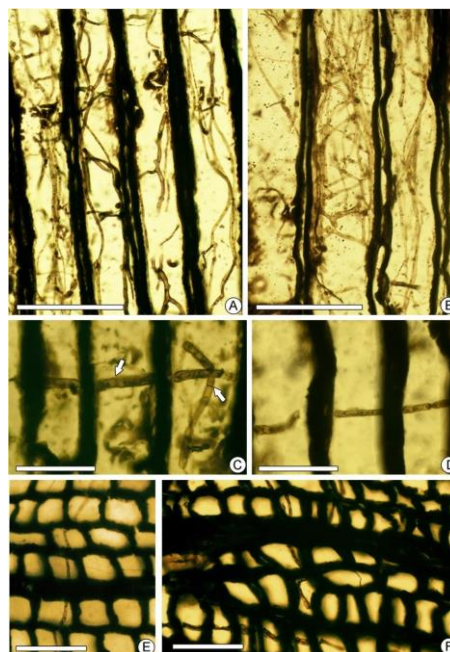
Timing of Early and Middle Permian deglaciation of the southern hemisphere: Brachiopod-based <sup>87</sup>Sr/<sup>86</sup>Sr calibration. (*Earth and Planetary Science Letters*, <https://doi.org/10.1016/j.epsl.2019.03.039>)

CENOZOOSTRATIGRAPHIC UNITS	RADIOLARIAN ZONES AND SUBZONES									
	North America		Europe		Japan		Far East Russia		N.E. China	Southwest China
	Rhine 1984	Center 1993	Koser & Mosler 1994, 1996; Koser et al. 1996	Sagayeva 1997	Brugué 1991	Yang 1991	Feng 2000	Wang 2002	This study	
Upper Triassic	Rhätian			TR 10 Hirsutiocyclonema hirsutum						
				TR 10C Skat P						
				TR 10D Triassosaxatilis pseudohabesi						
				TR 10E Triassosaxatilis multidentata group						
				TR 11 Lyomela obliqua						
	Norian			TR 4B Triadites robustus-Lyomela obliqua						
				TR 6A Capodocia-Triadites						
				Xipha intensa						
				TR 5B Psaltes cartharus						
				TR 5A Capuchophora						
Middle Triassic	Ladinian			TR 4B Spangisella delhi						
				TR 4A Muehlenbergia cochlear						
				TR 4B Yohania elegans group						
				TR 3A Spine A2						
				TR 2C Triassocampe deweyi						
	Anisian			TR 2B Triassocampe coronata group						
				TR 2A Eptagium radiolatum group						
				TR 2C Triassocampe coronata						
				TR 2A Eptagium radiolatum group						
				TR 2C Triassocampe coronata						
Lower Triassic	Induan			TR 1A Eptagium radiolatum group						
				TR 1A Eptagium radiolatum group						

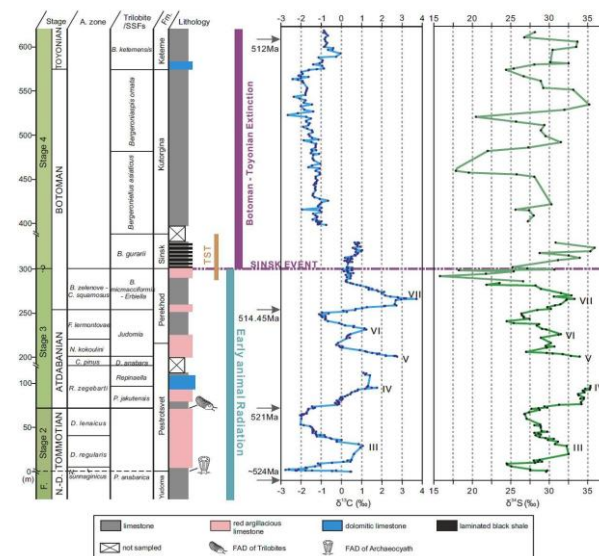
Late Anisian radiolarian assemblages from the Yarlung-Tsangpo Suture Zone in the Jinlu area, Zedong, southern Tibet: Implications for the evolution of Neotethys. (*Island Arc*. <https://doi.org/10.1111/iar.12302>)



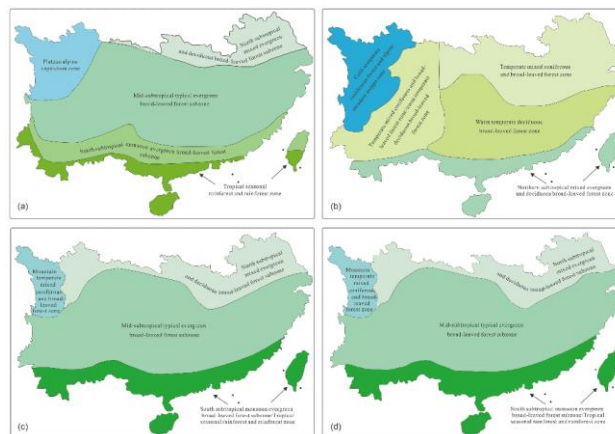
Re-evaluation of the systematic position of the Jurassic–Early Cretaceous fern genus *Coniopteris*. (*Cretaceous Research*. <https://doi.org/10.1016/j.cretres.2019.04.007>)



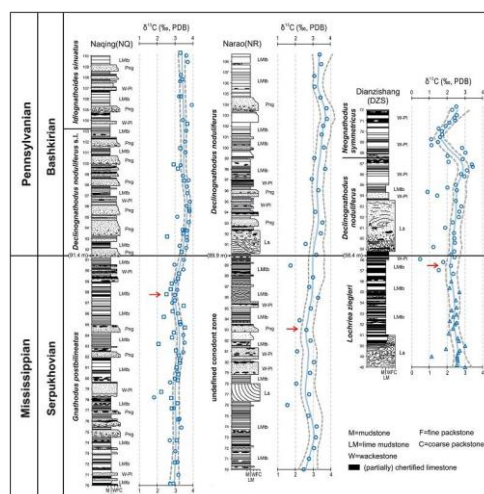
White-rotting fungus with clamp-connections in a coniferous wood from the Cretaceous of Heilongjiang Province, NE China. (*Cretaceous Research*, <https://doi.org/10.1016/j.cretres.2018.11.011>)



Possible links between extreme oxygen perturbations and the Cambrian radiation of animals. (*Nature Geoscience*, <https://doi.org/10.1038/s41561-019-0357-z>)

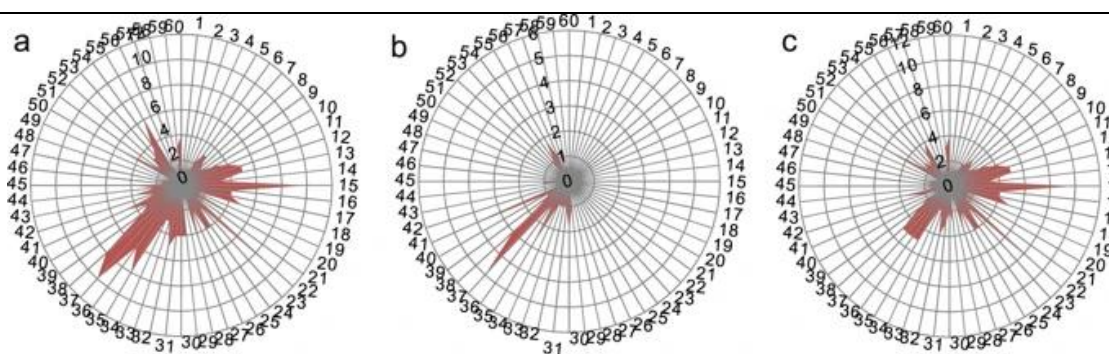


Changes of vegetation in southern China. (*Science China Earth Sciences*, <https://doi.org/10.1007/s11430-018-9364-9>)

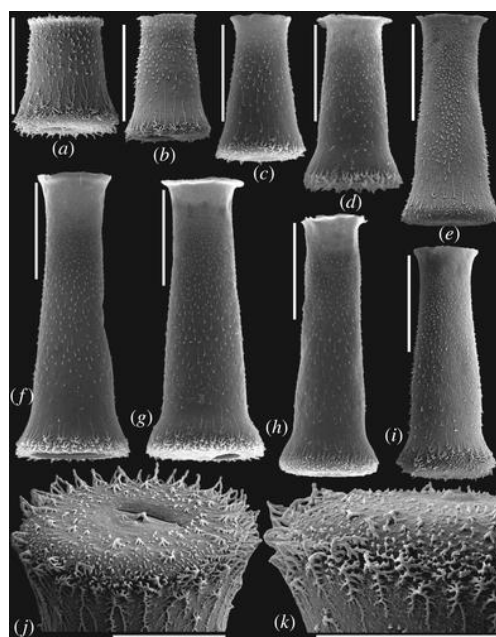


Glacio-eustasy and  $\delta^{13}\text{C}$  across the Mississippian–Pennsylvanian boundary in the eastern Paleotethys Ocean (South China): Implications for mid-Carboniferous major glaciation. (*Geological Journal*, <https://doi.org/10.1002/gj.3551>)

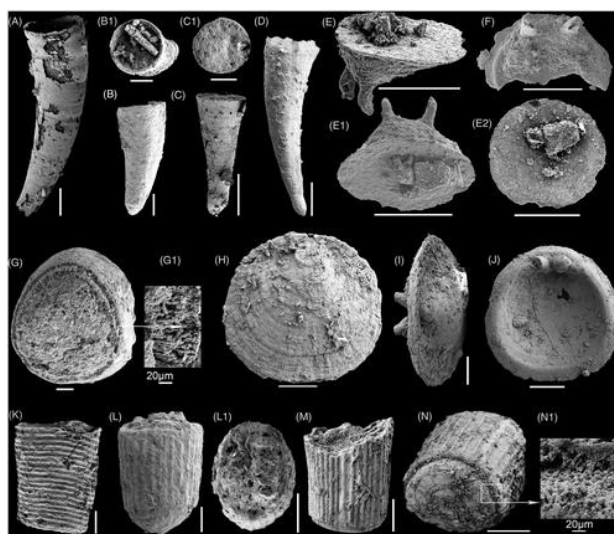




Tree ring phototropism and implications for the rotation of the North China Block. (*Scientific Reports*. <https://doi.org/10.1038/s41598-019-41339-2>)



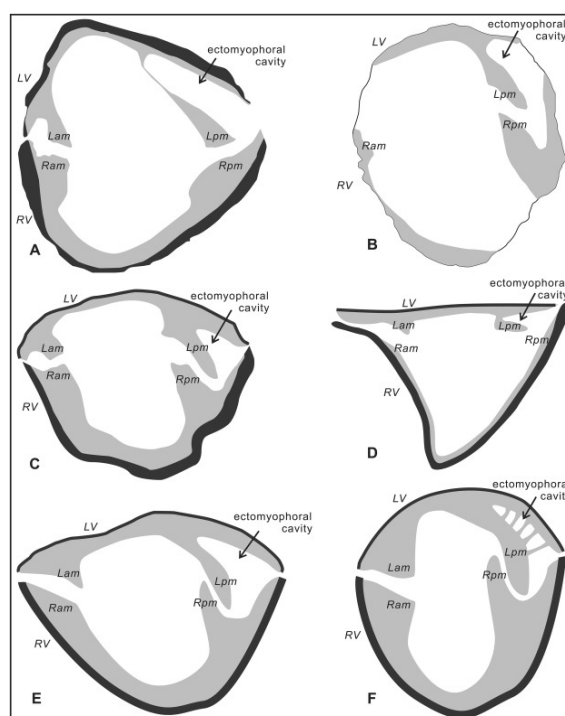
Morphological variation suggests that chitinozoans may be fossils of individual microorganisms rather than metazoan eggs. (Proc. R. Soc. B. <https://doi.org/10.1098/rspb.2019.1270>)



Biostratigraphical and palaeogeographical implications of early Cambrian hyoliths from the North China Platform. (*Alcheringa*. <https://doi.org/10.1080/03115518.2019.1577492>)

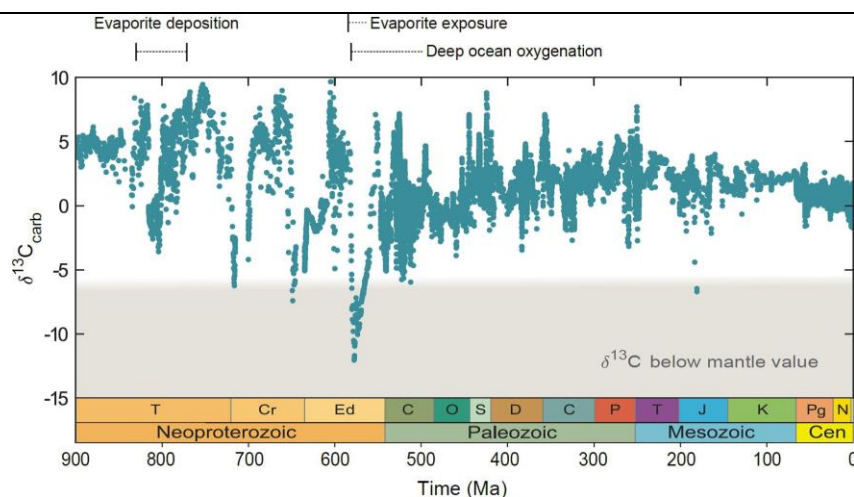


Sexual dimorphism in mid-Cretaceous silvanid beetles from northern Myanmar (Coleoptera, Silvanidae, Brontinae). (*Palaeoentomology*. <http://dx.doi.org/10.11646/palaeoentomology.2.3.14>)



*Shajia*, a new genus of polyconitid rudist from the Langshan formation of the Lhasa block, Xizang (Tibet), and its palaeogeographical implications. (*Cretaceous Research*. <https://doi.org/10.1016/j.cretres.2019.05.009>)

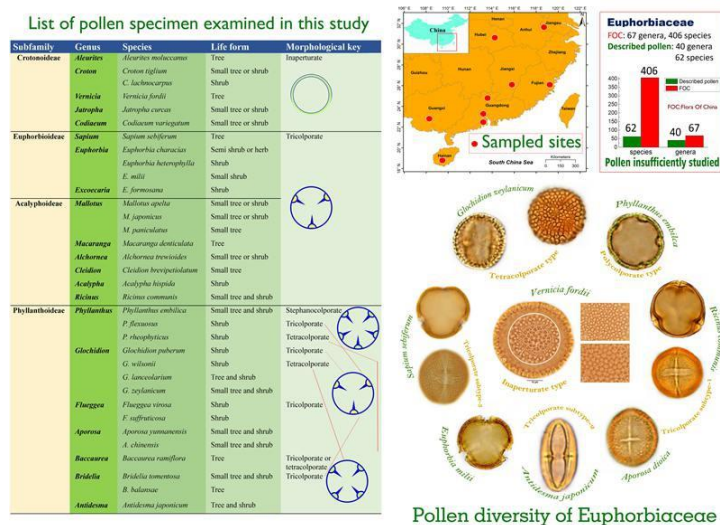




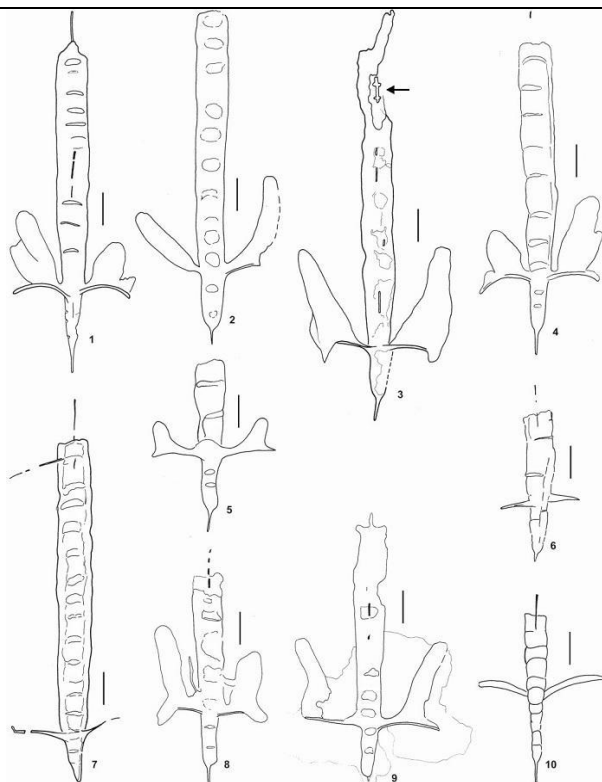
Unique Neoproterozoic carbon isotope excursions sustained by coupled evaporite dissolution and pyrite burial. (*Nature Geoscience*, <https://doi.org/10.1038/s41561-019-0434-3>)



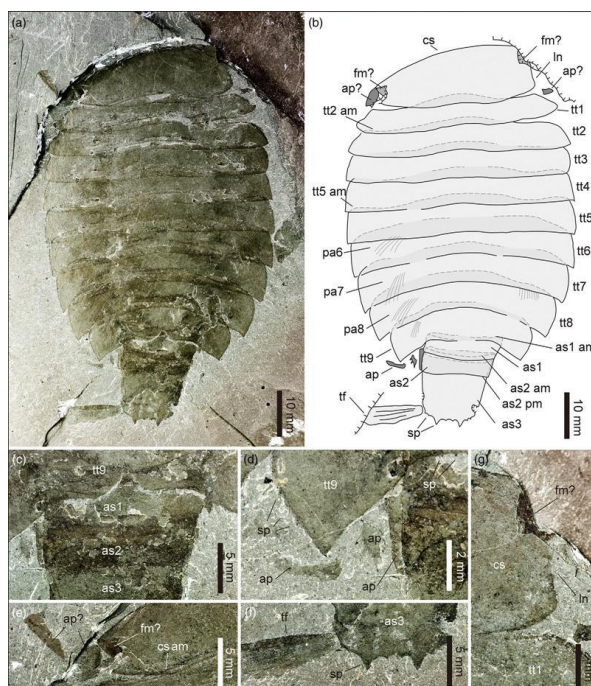
A middle Cambrian arthropod with chelicerae and proto-book gills. (*Nature*, <https://www.nature.com/articles/s41586-019-1525-4>)



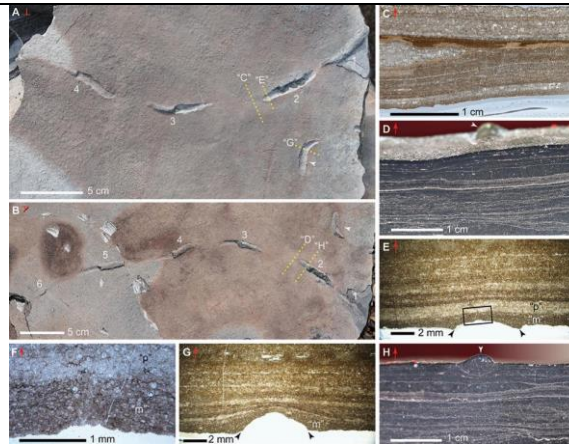
Pollen atlas for the selected subfamilies of Euphorbiaceae from southern China: A complementary contribution to Quaternary pollen analysis. (*Palynology*, <https://doi.org/10.1080/01916122.2019.1658235>)



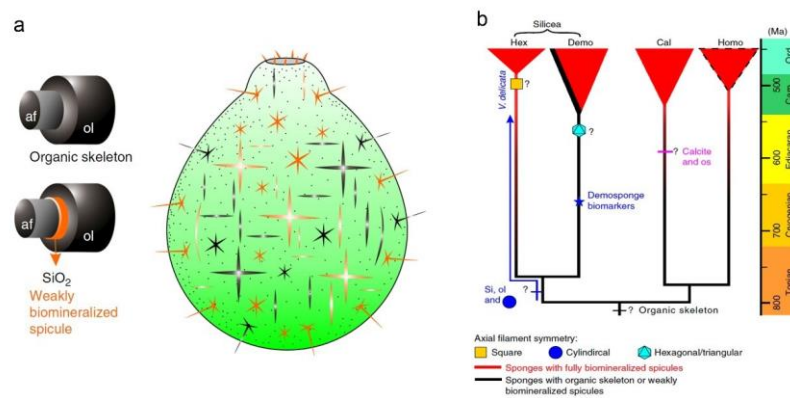
A restudy of the Sandbian to Katian (Upper Ordovician) graptolites from the East Qilianshan (Chilianshan), Northwest China. (*Journal of Palaeontology*. <https://doi.org/10.1017/jpa.2019.55>)



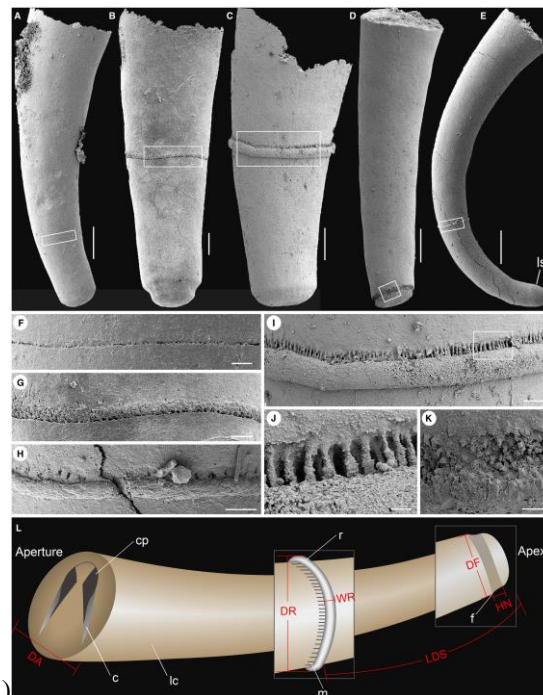
First occurrence of the Cambrian arthropod *Sidneyia* Walcott, 1911 outside of Laurentia. (*Geological Magazine*. <https://doi.org/10.1017/S0016756819000864>)



Surfing in and on microbial mats: Oxygen-related behavior of a terminal Ediacaran bilaterian animal. (*Geology*. <https://doi.org/10.1130/G46474.1>)

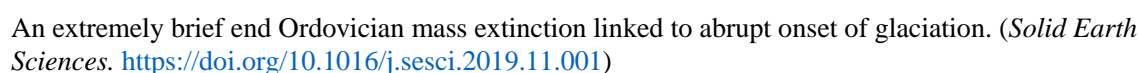
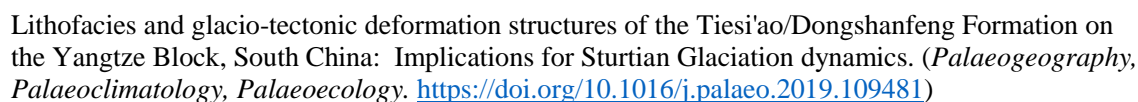
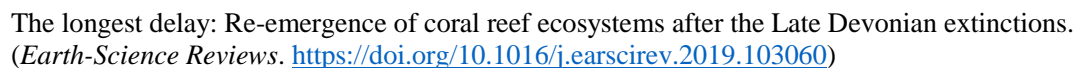


Spiculogenesis and biomineralization in early sponge animals. (*Nature Communications*. <https://doi.org/10.1038/s41467-019-11297-4>)

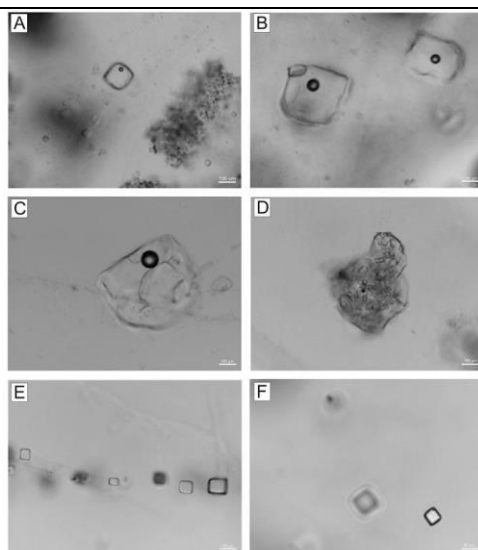


Periodic shell decollation as an ecology-driven strategy in the early Cambrian *Cupithecina*. (*Palaeontology*. <https://doi.org/10.1111/pala.12463>)

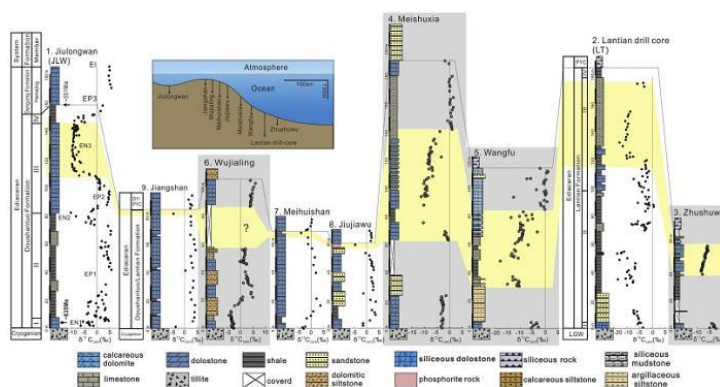




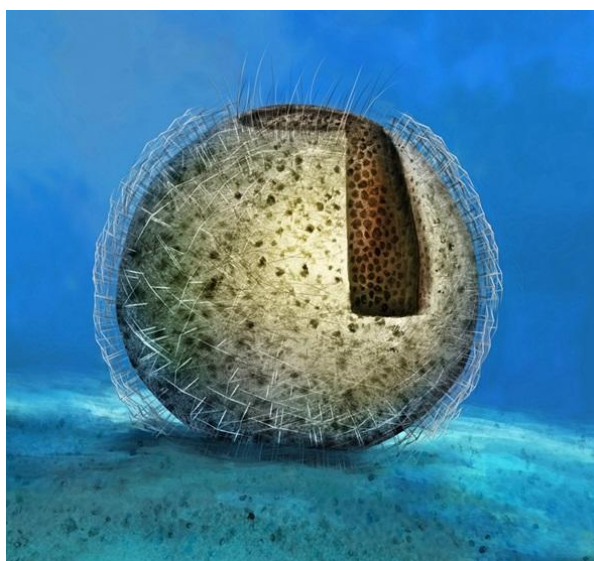




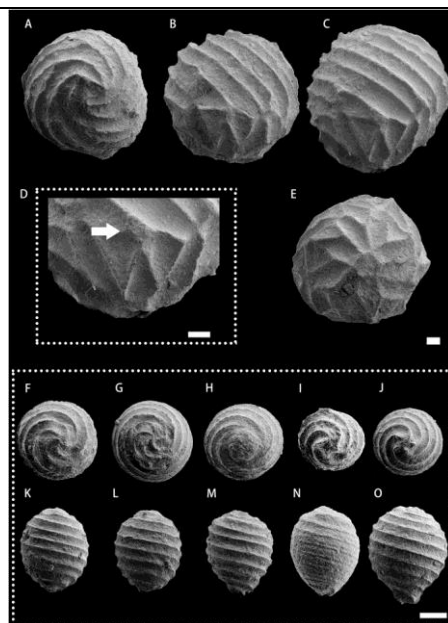
Calculation of salt basin depth using fluid inclusions in halite from the Ordovician Ordos Basin in China. (*Geological Quarterly*. <http://dx.doi.org/10.7306/gq.1490>)



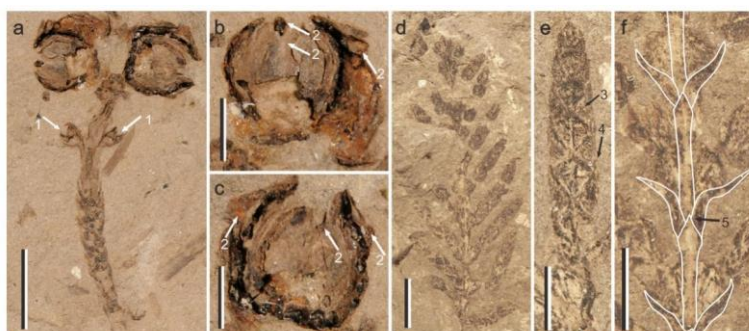
Spatial and temporal evolution of Ediacaran carbon and sulfur cycles in the Lower Yangtze Block, South China. (*Palaeogeography, Palaeoclimatology, Palaeoecology*. <https://doi.org/10.1016/j.palaeo.2019.109417>)



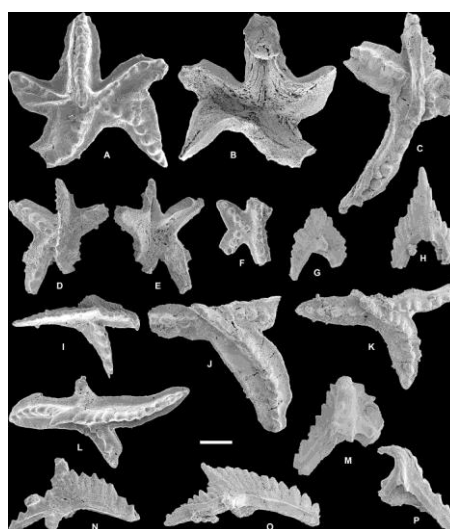
Oldest known fossil of Rossellids (Hexactinellida, Porifera) from the Ordovician–Silurian transition of Anhui, South China. (*Palaontologische Zeitschrift*. <https://doi.org/10.1007/s12542-019-00452-3>)



Filling a gap in the evolution of charophytes during the Turonian to Santonian: Implications for modern physiognomy. (*Review of Palaeobotany and Palynology*, <https://doi.org/10.1016/j.revpalbo.2019.104154>)



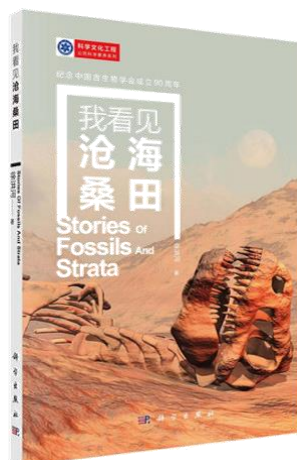
Fossil evidence reveals how plants responded to cooling during the Cretaceous-Paleogene transition. (*BMC Plant Biology*. <https://doi.org/10.1186/s12870-019-1980-y>)



First documentation of Llandovery (Silurian) conodont genus *Astropentagnostus* in China (Langao, Shaanxi Province) and the age of Baiyaya Formation. (*Palaeoworld*. <https://doi.org/10.1016/j.palwor.2019.11.002>)

## New Books

### Science books



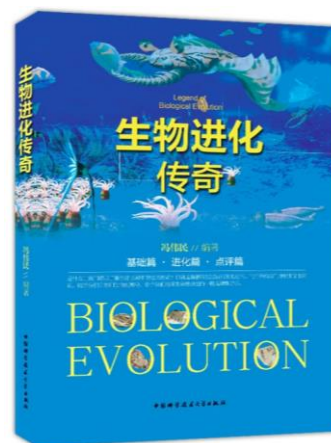
This book shows the magnificent seas and lands that the Earth has experienced, a systematic description about scientific discoveries and stories in the earth science research and the fleeting moments in geological history.

**Book information:**

XU Honghe. 2019. **Stories of Fossils and Strata**. Science Press.

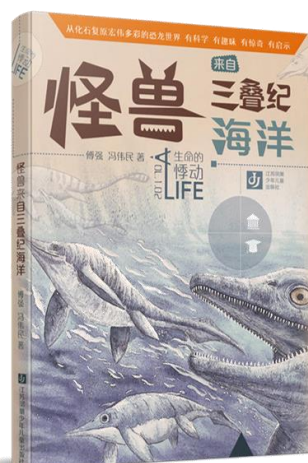
ISBN: 978-7-030-61636-4.

This book contains four parts: basic, evolution, review and appendix. The basic article introduces the basic knowledge of paleontology; the evolution chapter introduces the latest paleontological knowledge and achievements, especially the Cambrian Explosion and its great significance; the review article is mainly the author's inspiration for the understanding of biological evolution events and taxa; the three articles in the appendix are the author's perception of the local customs on the way and the natural life phenomena.



**Book information:**

FENG Weiming. 2019. **Legend of Biological Evolution**. China University of Science and Technology Press. ISBN: 978-7-312-04578-3.



This is a science book for children that uses fossils to introduce vertebrates in the Triassic sea.

**Book information:**

FU Qiang, FENG Weiming. 2019. **Monsters from the Triassic Sea**. Jiangsu Phoenix Children's Publishing House.

ISBN: 978-7-558-41086-4.

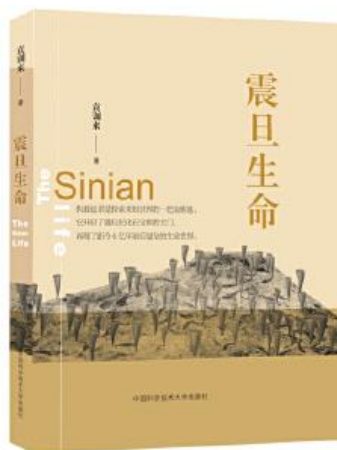
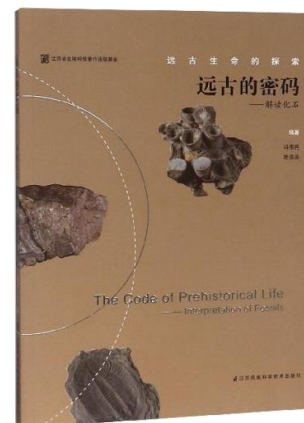


This book mainly describes the methods to recognize fossils, identify fossils, comprehend fossils, and explore the classic fossils in geological period and the relationship between fossils and humans.

**Book information:**

FENG Weiming, YE Facheng. 2019. **The Code of Prehistorical Life - Interpretation of Fossils**. Jiangsu Science and Technology Press, Phoenix Science Press.

ISBN: 978-7-553-79281-1.



This book introduces the journey of the author and his research team from Weng'an, Guizhou, to Huangshan Mountain, Anhui, and to Zigui, western Hubei, and shows the cooperation and persistent spirit of scientific researchers. The author explains the early forms and evolution progress of the complex life in detail using exquisite fossil photographs of the Sinian Period and simple texts.

**Book information:**

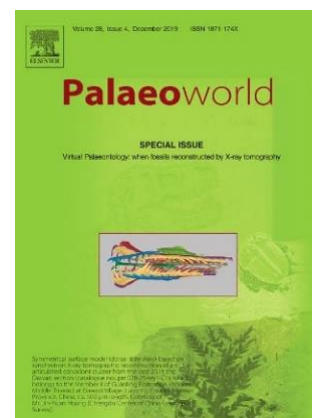
YUAN Xunlai. 2019. **The Sinian Life**. China University of Science and Technology Press. ISBN: 978-7-312-04626-1.

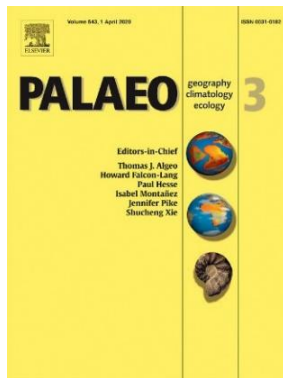
**Album**

A thesis album entitled "Virtual Palaeontology: when fossils reconstructed by X-ray tomography" was published in *Palaeoworld* (Volume 28, Issue 4).

**Related information link:**

<https://www.sciencedirect.com/journal/palaeoworld/vol/28/issue/4>





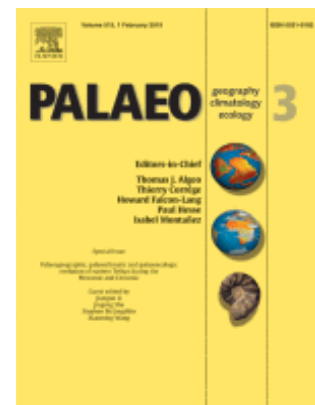
A thesis album entitled "Devonian to Early Permian-Prelude and progression of the Late Paleozoic Ice Age" was published in *Palaeogeography*, *Palaeoclimatology*, *Palaeoecology*. The album contains 1 review paper and 23 research papers, divided into 2 volumes (531 volumes A & B).

**Related information links:**

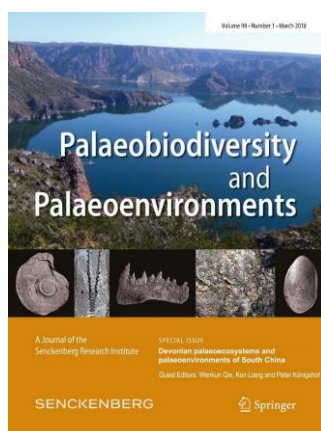
<https://www.sciencedirect.com/journal/palaeogeography-palaeoclimatology-palaeoecology/vol/531/part/PA>;

<https://www.sciencedirect.com/journal/palaeogeography-palaeoclimatology-palaeoecology/vol/531/part/PB>

A thesis album entitled "The East Tethys Mesozoic and Cenozoic Geology and Paleontology Evolution Research Album" was published in *Palaeogeography*, *Palaeoclimatology*, *Palaeoecology* (Volume 515). This new album includes 13 research papers and a preface review and contains the latest research results by scientists from China, Australia, Switzerland, the United States, Britain, and Germany dealing with the fields as petrology, geochemistry, paleontology, and sedimentology of East Tethys.



**Related information link:** <https://www.sciencedirect.com/journal/palaeogeography-palaeoclimatology-palaeoecology/vol/515/suppl/C>



The album entitled "Devonian palaeoecosystems and palaeoenvironments of South China" was published in *Palaeobiodiversity and Palaeoenvironments*. It contains 1 preface and 8 research papers. It comprehensively collated and systematically summarized the research progress of Devonian paleontology and paleoecology in recent years.

**Related information link:**

<https://link.springer.com/journal/12549/99/1/page/1>

## Researchers of NIGPAS

On November 18, eight senior paleontologists were awarded “Lifetime Achievement Honor” by the Palaeontological Society of China (PSC) at the Opening Ceremony of the First Asian Palaeontological Congress (APC) with celebrations the 90<sup>th</sup> anniversary of the Palaeontological Society of China (PSC). Academician ZHOU Zhiyan and Academician CHEN Xu from NIGPAS won this honor.

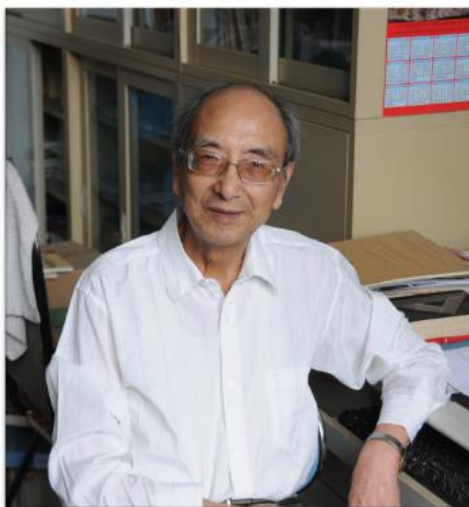


Prof. ZHOU Zhiyan is a renowned paleobotanist and stratigrapher. He was elected as an academician of the Chinese Academy of Sciences in 1991, a honorary member of the Palaeobotanical Section of American Botanical Society from 1989, and a honorary member of Palaeontological Society of China (PSC). He was the vice chairman of the International Organization of Paleobotany (IOP) from 1987 to 1992, committee member of International Association of Plant Taxonomy (IAPT) and committee member of fossil plants from 1993 to 2006.

He participated in the compilation of comprehensive treatises on "Chinese Geological Strata" and "Chinese Fossils", presided over the comprehensive research on the Mesozoic coal series and their faunas and floras in Northeast and Central South China. He is the first person to systematically study the Early Jurassic flora in southern China. He pointed out the potential taxonomic significance of the cuticle micro- and ultrastructure of *Suturovagina* Chow et Tsao (Cheirolepidiaceae), systematically summarized on the oldest *Ginkgo biloba*, Podocarpaceous, and Cheirolepidiaceous



fossils, and studied on Early Tertiary ferns from Fildes Peninsula, King George Island, Antarctica. His systematic study of the Mesozoic Ginkgoalean megafossils is regarded as a landmark work in the field.



Prof. ZHOU Zhiyan

His representative works include "Mesozoic continental deposits of China", "Mesozoic ginkgoaleans: Phylogeny, classification and evolutionary trends", "Comparative studies of leaf cuticle ultrastructure between living and the oldest known fossil *Ginkgo* in China", etc. In 2009, he started to organize the compilation of "Chinese Paleoflora", and finished the volume of "Chinese *Ginkgo* Plants" in 2017. He has won the first prize of the Natural Science Award of the Chinese Academy of Sciences; the second prize of the Jiangsu Science and Technology Award; the Centennial Commemorative Award of the Sahni Foundation of India and many other honors.

Prof. CHEN Xu, a renowned paleontologist and stratigrapher, an Academician of the Chinese Academy of Sciences, and an Honorary Member of the Paleontological Society of China. He was the Chairman of the Graptolite Group of the International Palaeontological Association in 1990s and the Vice-Chair and Chair of the Subcommittee on Ordovician Stratigraphy (1992-2008), International Commission on Stratigraphy

In addition to the compilation of the book *Graptolites of China*, he established and redefined substantially the division and correlation of graptolite zones of Ordovician to Early Devonian in China. In 1997, he led an international working group and successfully established the Global Boundary Stratotype Section and Point (GSSP) for the Darriwilian Stage of the Ordovician at Huangnitang, Changshan, Zhejiang Province,

which was the first GSSP in China and also the first within the Ordovician System globally. In recent years, he adopted series of new methods to address the process and mechanism of the graptolite extinction and survival in the Ordovician-Silurian transition time, which turned out to be a great success of global influence. In cooperation with leading scientists of USA, he compiled a total of 26 reconstruction maps of the global climate zones from Cambrian to Miocene, which systematically demonstrate the evolution of the global climate during Phanerozoic. Among his latest achievements, the project "Marine-facies Stratigraphy of China" led by him and sponsored by SinoPec, has contributed substantially to the exploration and development of shale gas in China.



Prof. CHEN Xu

So far, he has published more than 230 scientific papers and some fifteen volumes of monographs. He was awarded the Second Prize of the National Natural Science Award, the First and Second Prizes of the Natural Science Award of the Chinese Academy of Sciences respectively, the Li Siguang Award for Geological Sciences, and the Golden Medal of Charles University Prague.

As Paleontology is a "small subject" of geology, but it is an indispensable "global subjects" in exploring the long history of the earth's evolution and the origin of life. With the efforts of the older generation of Chinese geologists and paleontologists, the Palaeontological Society of China (PSC) has become one of the academic communities with a long history, far-reaching impact, and remarkable achievements in the Chinese natural sciences. It also holds a very important position in the world paleontological communities.

## WELCOME TO JOIN US

### **M.Sc., Ph.D., and Postdoctoral Programs**

NIGPAS offers M.Sc. and Ph.D. degree-granting programs and a postdoctoral program in paleontology, stratigraphy, and geobiology. Undergraduate students or M.Sc. holders who are interested in applying for M.Sc. or Ph.D. programs are warmly welcome and are required to take the entrance examinations (two subjects respectively related to the particular specialities).

The postdoctoral program is open to young scientists worldwide who hold a Ph.D. degree and are under the age of 40. All Ph.D. holders of geology and related subjects who are interested in collaborating with staff members of NIGPAS are encouraged to contact us to start a new life at NIGPAS. The main research areas of our Institute include:

The Origin and Evolution of Early Life on Earth

Evolutionary Paleontology

Chronostratigraphy

Systematic Paleontology (of all invertebrate fossil groups and fossil plants)

Paleoecology, Paleogeography and Paleoclimatology

Molecular Paleobiology

Geobiology

Co-evolution of Life and Environment in deep time

Applied Paleontology and Stratigraphy

Interested applicants may contact relevant experts of our Institute or the particular office for foreign affairs of NIGPAS for more information (see contact information below).

### **Faculty Positions (3-5 yearly) Open: Applications invited**

Recent Ph.D. holders and experienced scientists of various career levels, with research capabilities potentially enhancing or supplementing the current programs at NIGPAS (please refer to <http://english.nigpas.cas.cn/rh/rps/>), are invited to apply for our faculty positions. Interested persons are encouraged to send a letter of enquiry to the contact information below.



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**Recruitment for Senior Faculty Positions**

As one of the academic leaders, successful applicant will be responsible to establish a research program in paleontology and related fields that will complement or enhance the institute current research programs. Interdisciplinary approaches are especially encouraged.

The applicant should have a demonstrable track record and abilities to develop an advanced research program in paleontology and related areas. A Ph.D. degree and former appointment at a senior level in universities or other academic institutions are required. A minimum of three years full time commitment is required for this position.

For successful applicants, the institute will provide a start-up research grant (negotiable amount), necessary lab and office space, and supporting staff.

We also would appreciate your recommendation of any capable candidates. Please contact us.

**Contact us**

For comments and suggestions, please contact:

Office of Foreign Affairs

Nanjing Institute of Geology and Palaeontology, CAS

39 East Beijing Road, Nanjing 210008, P.R. China

Phone: 0086 25 83282105 Fax: 0086 25 83357026

Email: [ngb@nigpas.ac.cn](mailto:ngb@nigpas.ac.cn); [chxzh@nigpas.ac.cn](mailto:chxzh@nigpas.ac.cn)