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ABSTRACT

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Reconstruction of the first consumer-driven marine ecosystem on Earth, perspectives from early Cambrian small skeletal fossils from China

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Biological activity was the major triggering factor driving Earth's organic and inorganic cycles across the biosphere, lithosphere, and atmosphere. A key question in the evolution of Earth's ecosystem is when and how different animals emerged and flourished and how their appearance impacted the hydrosphere-atmosphere-lithosphere cycles. The Cambrian Explosion of metazoans in the Ediacaran–Cambrian boundary interval resulted in sudden appearance of most of the readily fossilizable modern animal groups as macro-consumers in the Earth's oceans. This explosive radiation event led for the first time to the emergence and diversification of animals on Earth, to the establishment of complex trophic webs with animals as consumers, and marks the onset of the Phanerozoic oceanic ecosystem. Our presentation aims to discuss the at least half-billion-year-old world of tubular and conical shelled organisms (sponges, conulariids, cancelloriids, hyoliths, mollusks, tomotiids, and other lophotrochozoans) that are unseen in the present-day oceans but were recovered by us from the siliciclastic and carbonate rocks in and outside of China. Additionally, to study the body fossils of exceptionally preserved biotas (Konversat-Lagerstätten) across China, efforts are underway to understand how the early animals, notably early bilaterians, created the over 500-million-year-old oceanic ecosystems without the influence of land plants, which appeared later.



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