

The Ediacaran-Cambrian transition of North China

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The central mountain range, known as the backbone of China, separates the country into North China and South China, which are different from each other in geology, geography, climate, and culture. The Precambrian-Cambrian transition of South China has received much attention of world scientists for beautiful sections and numerous fantastic fossil-Lagerstätten. However, the Ediacaran-Cambrian sequences of North China have some attractive points as well. The lowermost Cambrian of North China, the Xinji Formation, unconformably overlies Precambrian rocks of various ages, from Archean to late Ediacaran. The Xinji Formation is rich in SSFs of Cambrian Epoch 2 aspects and thus the Terreneuvian is absent throughout North China. The Xinji SSF assemblage is taxonomically dominated by molluscs and hyoliths, which are represented by 26 and 12 species, respectively. A number of molluscan taxa are conspecific with Australia, Antarctic and Laurentia, and thus have biostratigraphical and paleobiogeographical values. Remarkably, shell microstructures are well preserved in molluscs and hyoliths, which demonstrate how these Cambrian animals use minute mineral crystals to build their shells. Additionally, shell microstructures shed new light on the phylogenetic links between the groups. Ediacaran rocks developed in marginal regions and cratonic basins. Along the south and west margins of North China, the Dongpo/Tuerkeng Shale/Slate immediately underlies the unconformity and overlies the Luoquan/Zhengmuguan Diamictite which is poorly constrained in age. The shale/slate unit above the diamictite yields a diverse form of macroscopic, soft-bodied fossils, e.g. the annulated tubular form *Shaanxilithes*, the form of a string of beads *Horodyskia*, the WiFi symbol-like form *Palaeopascichnus*, an unnamed form resembling a string of rings (which might be a segmented organism composed of many repetitive units), and small clew-like fossils of unknown affinities. Algal fossils are abundant but simple in complexity and poor in diversity. The presence of *Shaanxilithes* and *Palaeopascichnus* suggests an age of late Ediacaran. New specimens demonstrate that *Shaanxilithes* is composed of a cone-in-cone internal tube encased in a flexible external tube with irregular cross annulations. Such a morphological reconstruction is analogous to the contemporary *Cloudina* and other tubular organisms. New findings in North China would provide new insights into the biotic evolution of the Ediacaran-Cambrian transition.

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