Paper Number: 3727

The evidence of the Late Paleozoic Glaciation in South China

Wang, X.D., Chen, J.T., Qie, W.K., Sheng, Q.Y. and Qi, Y.P.

Key Laboratory of Economic Stratigraphy and Palaeogeography, Nanjing Institute of Geology and Palaeontology, the Chinese Academy of Sciences, Nanjing 210008, China, xdwang@nigpas.ac.cn

---

South China is composed of several blocks and/or platforms during Late Paleozoic time. The most western part is the Baoshan block which records glaciation-origin diamictites in the lower Permian. Other parts of South China record the characteristic Paleo-Tethyan biota and depositional types. The base of the Carboniferous is characterized by microbial sediments that indicate the beginning of transgression after the Hangenberg extinct event of the topmost Devonian. The Mississippian lithology is diverse, ranging from basinal and shelf carbonate rocks to coal measures and continental clastics, which consists of several major sedimentary cycles. The Pennsylvanian and Lower Permian, however, are composed mostly of shallow-marine carbonates, which consist of remarkable, high frequency sedimentary cycles that were highlighted by as many as more than 25 subaerial exposures.

Our recent studies mainly focused on the geological interpretation with respect to initiation of the Late Paleozoic glaciation. High-resolution carbon isotope ($\delta^{13}C$) records, detailed sedimentary facies analysis, and biotic changeover of the late Visean-early Serpukhovian carbonate platform-to-slope successions from South China have been done in order to better understand the initiation and process of the Late Paleozoic glaciation. Based on vertical assemblages of the sedimentary facies, three depositional units are recognized, recording a significant sea-level drawdown across the V-S boundary. Under the framework of high-resolution biostratigraphy, several negative $\delta^{13}C$ excursions (>1‰) are recognized and correlated below and right above the V-S boundary in slope and/or basinal sections. In addition, the $\delta^{13}C$ data of the lower Serpukhovian show a gradual but distinct negative shift by 3.22‰ in the platform section, and this shift gradually decreases in amplitude laterally in a platform-to-slope transect, which might be caused by shedding of ^{13}C-delpleted platform sediment onto the carbonate slopes. This negative trend in $\delta^{13}C$ and the depositional sequences at the platform section from South China can be correlated to those from the Arrow Canyon section, USA, which, together with other coeval sedimentary and geochemical records elsewhere, indicate a synchronous eustatic drawdown most likely caused by growth of Gondwana ice sheet.

Late Paleozoic faunas in South China show a decrease in the diversity of benthic biota in the Serpukhovian, followed by a change in the composition of fossil assemblages at the Mid-Carboniferous boundary. This compositional change was associated with a regressive event, recognized by the absence of upper Serpukhovian strata in many places and by several erosional surfaces in carbonate sequences. This regressive event was probably caused by an episode of glaciation in Gondwana.