



Estonian Journal of
Earth Sciences
2023, 72, 1, 165

<https://doi.org/10.3176/earth.2023.33>

www.eap.ee/earthsciences
Estonian Academy Publishers

ABSTRACT

Received 19 April 2023
Accepted 30 April 2023
Available online 16 June 2023

Keywords:

Lower and Middle Ordovician,
carbon isotopes, chemostratigraphy,
Yangtze Platform, South China

Corresponding author:

Rongchang Wu
rcwu@nigpas.ac.cn

Citation:

Wu, R., Gong, F., Calner, M., Liu, J.,
Lehnert, O., Luan, X. et al. 2023.
High-resolution carbon isotope
stratigraphy of the Lower and Middle
Ordovician succession of the Yangtze
Platform, China. *Estonian Journal of Earth
Sciences*, **72**(1), 165.
<https://doi.org/10.3176/earth.2023.33>

High-resolution carbon isotope stratigraphy of the Lower and Middle Ordovician succession of the Yangtze Platform, China

Rongchang Wu^a, Fangyi Gong^a, Mikael Calner^b, Jianbo Liu^c,
Oliver Lehnert^{a,d}, Xiacong Luan^a, Guanzhou Yan^a, Lixia Li^a
and Renbin Zhan^a

^a State Key Laboratory of Palaeobiology and Stratigraphy (NIGP, Chinese Academy of Sciences), 39 East Beijing Road, Nanjing 210008, China

^b Department of Geology, Lund University, Sölvegatan 12, SE-223 62 Lund, Sweden

^c Palaeontology and Stratigraphy, School of Earth and Space Sciences, Peking University, 5 Yiheyuan Road, Haidian District, Beijing 100871, China

^d GeoZentrum Nordbayern, Lithosphere Dynamics, University of Erlangen-Nürnberg, Schlossgarten 5, D-91054, Erlangen, Germany

Variation in the relative abundance of the stable carbon isotopes has been widely used to correlate Ordovician marine successions over the past two decades. To date, only a few of studies of Ordovician carbon chemostratigraphy have been conducted in South China. Most of the previous studies in this field have focused on specific time intervals and/or events in the Middle and Upper Ordovician. The Lower and Middle Ordovician of the Yangtze Platform is typically represented by a sedimentary succession dominated by carbonate rocks, which is ideal for studying the carbon chemostratigraphy. Three sections spanning the Nantsinkuan/Lunshan, Fenhsiang, Hunghuayuan, and Dawan/Zitai formations, corresponding to the Tremadocian–Dapingian in age, have been sampled for high-resolution $\delta^{13}\text{C}$ chemostratigraphy. Our new $\delta^{13}\text{C}$ data reveal five tie-points with the potential for global correlation: (1) a positive $\delta^{13}\text{C}$ excursion in the lower Nantsinkuan Formation within the Tremadocian *Rossodus manitouensis* Zone; (2) an excursion with two peaks roughly within the late Tremadocian *Paltodus 'deltifer'* Zone; (3) a positive $\delta^{13}\text{C}$ shift in the lower Hunghuayuan Formation, within the early Floian *Serratognathus diversus* Zone; (4) a gradual positive $\delta^{13}\text{C}$ shift in the late Floian, ranging from the uppermost *S. diversus* Zone to the basal *Oepikodus evae* Zone; (5) a minor negative shift in the lower Dawan/Zitai Formation, within the early Dapingian *Baltoniodus triangularis* Zone. These excursions are herein used for correlation of the Yangtze Platform strata with successions from South China, North China, the Argentine Precordillera, North America and Baltica. From a palaeogeographical perspective, the Gudongkou, Xiangshuidong and Daling sections represent depositional environments along an inner to outer ramp profile. The $\delta^{13}\text{C}$ data from these sections show successively heavier (higher) $\delta^{13}\text{C}$ values with increasing depositional depth, which can be interpreted as due to remineralization of organic carbon within the carbonate rocks formed in the shallow-water environment.



14TH ISOS
ESTONIA 2023