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Sedimentary Feature and Ore-controlling Feature of Cambrian Phosphorites in the Dengying Formation, Zhijin, Guizhou, China

Yang, R.¹, Mao, T.¹, Gao, J. and Mao, J.¹

¹College of Resources and Environmental Engineering, Guizhou University, Guiyang, 550025, China

A number of large phosphorite deposits were deposited on the Upper Yantze Platform during Meishucun Stage of the early Cambrian Period. The lower Cambrian phosphorites in the Guizhou Province are an important source of phosphate in China^[1]. The source and genesis of these phosphorites has been a focus of past studies^[2]. Here we investigate the sedimentary microfacies of phosphorous-bearing strata to understand the emplacement mechanism of the phosphorous and processes controlling ore formation^[2]. This study conducted field work, measured geological profiles and sampled the phosphorous-bearing sequence in the Zhijin and Qingzhen areas of the Guizhou Province. It was found that that the banded phosphorites and phosphorous siliceous rocks with horizontal bedding that characterize the Qingzhen area were deposited in a low-energy subtidal lagoonal environment. While the Gezhongwu in the Zhijin area was deposited in a high-energy intertidal-subtidal zone, and characterized mainly by cross bedding, lenticular bedding, bioclastics in phosphorite deposits, with a few small shell fossil phosphatic distributed randomly in the deposits^[3].

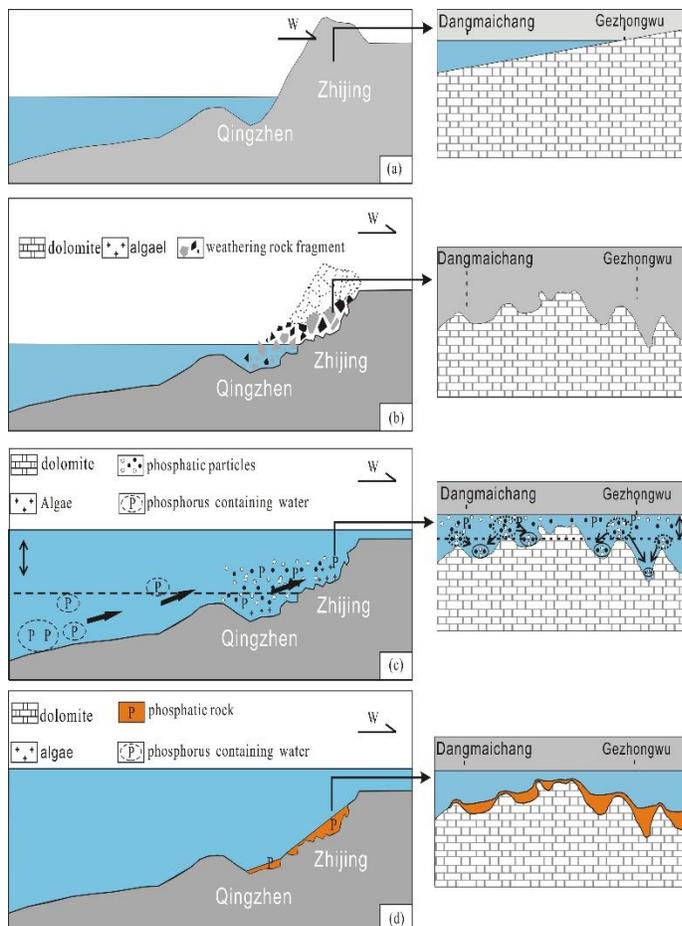


Fig. 1 Ancient karst controlling model of Zhijin phosphorite deposit in Guizhou

References:

- [1] Wu X et al. (1999) The Guizhou phosphorite deposit. The Guizhou S & T Press 1-152
- [2] Yang R et al. (2004) Progress in Natural Science 14(10): 898-904
- [3] Chen Jiyan et al. (2012) Journal of Rare Earths 31(1): 101-111
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The Xiongjiachang (Zhijing) area was a intertidal-subtidal zone, where shallow shoal and biologic beach developed. Through the analysis of drill hole information, it can be shown that phosphorite thickness at the bottom of Cambrian varies greatly in the Zhijing area and mainly controlled by ancient Karst unconformity level at the top of Dengying formation. The shore phosphatic fragments were accumulated by coastal current that deposited them in depression in the ancient Karst forming thicker clastic phosphorite than the highlands of ancient Karst. Therefore, according to the above-mentioned information, this study constitutes an ore-forming model of Cambrian phosphorite in the Zhijing area that has certain theoretical and practical significance for the exploration of phosphate deposits in the lower Cambrian of Guizhou Province.

