

Climate Records of Color and Magnetic Susceptibility of continental Sedimentary Rocks of the Lower Cretaceous in Jiuxi Basin, NW China

Dai, S.^{1,*}, Yan, N.¹, Chen, R.¹, Peng, D.¹

*1) Key Laboratory of Western China's Environmental Systems (MOE), College of Earth and Environmental Sciences, Lanzhou University, Lanzhou, China, *E-mail: daisher@lzu.edu.cn*

The Valanginian–Albian continental strata in the Jiuxi Basin, NW China, are composed of reddish or greenish clastic rocks and gray carbonate rocks. A total of 1682 samples were collected on the Hongliuxia section (2302.5 meters thick) and color indexes (lightness, redness and yellowness) and MS (calculated to low- and high-frequency mass MS) are measured. Rock-magnetism measurements show that magnetic minerals are mainly magnetite and maghemite in greenish and gray-black rocks, but hematite in reddish rocks. According to lithology, sedimentary facies, color indexes and MS, the section can be divided into four intervals upwards, representing four different phases of paleoenvironmental conditions, which seem to be related to palaeoclimatic changes. The first stage (0~197 m) represents alluvial fan facies, with gray greenish sandstone, siltstone and conglomerates. Redness and IMS (low-frequency mass MS) are relatively high (-1.94~13.38, $1.82\text{E-}8$ - $20.76\text{E-}8$ m³/kg), suggesting a relatively warm and humid climate. The second stage (196.7~1029.7 m) is made of gray-greenish sandstone, siltstone and conglomerates of alluvial and fan-delta deposits. Redness is relatively low (-1.78 ~ 9.24), but IMS is high and strongly fluctuation ($0.07\text{E-}8$ ~ $45.97\text{E-}8$ m³/kg), indicating relatively cold and humid conditions. The third stage (1029.7~1743.7 m) represents deep to semi-deep lake deposits, made of gray-black shales, mud- and marlstones Redness and IMS ranges -1.70~12.20 and $5.09\text{E-}8$ ~ $34.92\text{E-}8$ m³/kg, suggesting relatively dry and hot paleoclimatic conditions. The fourth stage (1743.7~2302.5 m) is made of reddish siliciclastic rocks of braided and meandering river deposits. Redness and IMS are high with strong fluctuations (-1.62~30.5 and $1.57\text{E-}8$ ~ $60.96\text{E-}8$ m³/kg), suggesting relatively humid and hot conditions. The proposed changes on the paleoclimate of this region are generally consistent with the global climate variations (FÖLLMI, 2012).

This study was funded by NSF of China (41272127).

FÖLLMI, K B., 2012, *Cretaceous Research*, **35**, 230–257.