

## CRETACEOUS OCEANIC SUPEROXIC EVENTS IN TIBETAN HIMALAYAS

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Globally, Cretaceous organic matter-enriched black shales are referred to the sediments of the so-called Oceanic Anoxic Events (Schlanger and Jenkyns, 1976). Recent studies had verified that the mid-Cretaceous black shales in southern Tibet also have a connection to global oceanic anoxic events (Wang Chengshan et al., 1999). It is of interest to note that there is series of 20-120m red marl/mudstone that overlapp the mid-Cretaceous black shales in Gyangze area. This alternation is known as Chuangde Formation, having formed from Late Santonian to Early Campanian.

Detailed analysis of the Chuangde Formation red beds demonstrates that: ① red beds are characterized by high  $\text{Fe}_2\text{O}_3$  and  $\text{P}_2\text{O}_5$ , and low TOC contents. Red color is caused by the high content of iron trioxide; ② rare earth element is characterized by negative Ce anomaly; ③ the all  $\delta^{13}\text{C}$  contents of the upper Cretaceous in southern Tibet are low than the average contents of the simultaneous whole world. In the Chuangde Formation,  $\delta^{13}\text{C}$  is very low at the bottom, while it increases upwards; ④. Our study shows  $\beta$ -carotene is a very sensitive biomarker to the change of the oxidize-reduce condition in these areas; ⑤. evolution of the microfossil of the upper Cretaceous is related to the dissolved oxygen content. Planktonic foraminifers are very abundant in these red marls.

Based on the global correlation of the red beds, we propose the hypothesis of "Oceanic Superoxic Events" to explain the origin of the worldwide upper-Cretaceous red beds.

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