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Discovery of new phosphorite ore-bearing strata and stromatolite phosphorites of Dengying Formation of Late Ediacaran in Guizhou Province, SW China

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Yangtze platform Doushantuoian is the first large-scale phosphorus forming peak period of China. The sedimentary phosphorite is widely distributed in South China. Phosphorite of the period equivalent to the Duoshantuo Formation generally covers a tillite layer; the phosphorite sedimentation after the glacial stage is a common feature of this period. But, as more studies were conducted in the Wengfu phosphorite deposit, we discovered new phosphorite ore-bearing strata and stromatolite phosphorites in the Upper Dengying Formation. This new finding is of great significance for further phosphorite prospecting in the Wengfu Area and even in Guizhou Province.

The newly found stromatolite phosphorites of the Dengying Formation are distributed along the eastern boundary between Weng'an and Fuquan Counties. They belong to the eastern part of the Duoshantuo mineralization belt. The newly found stromatolite phosphorites between the Niutitang Fm. of Early Cambrian and the phosphorites of the Duoshantuo Formation of Late Ediacaran are more than 150 m thick (Figs. 1a, b, c). It suggests that the stromatolite phosphorites are part of the Dengyingian phosphorites. The stromatolite phosphorites are light gray, milky columnar stromatolite dolomitic phosphorites with bedded-shape. The ores are 1.48–11.51 m thick with an average of 3.45 m. The contents of P_2O_5 are 15.29–32.91% with an average of 23.94%. They display convex laminations in the vertical section with a laminar ore thickness of 1–3 mm, and homocentric or oval in the transverse section with a diameter of 4–15 cm (generally 10cm) (Figs. 1d, e, f).

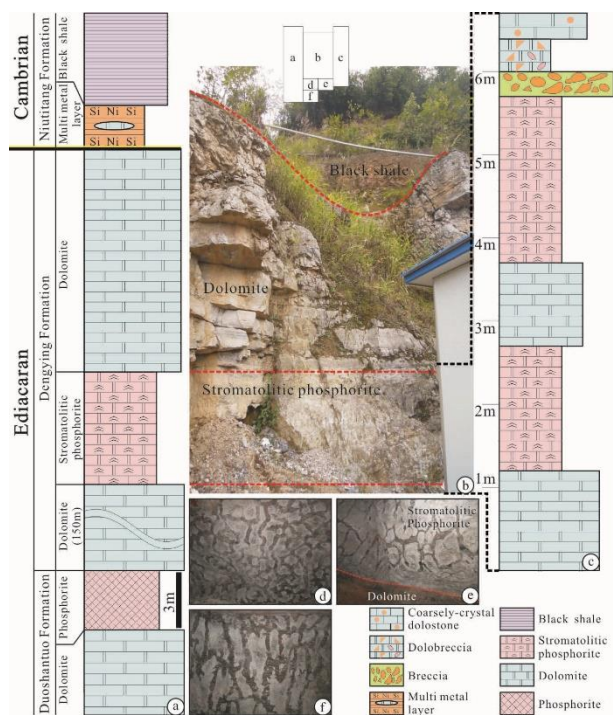


Figure 1: Lithological column and stromatolite phosphorite characteristics of Late Ediacaran, South China

Deposit prospecting in the Wengfu Area has been proposed for a long time aiming at looking for exploitable Doushantuoian phosphorites. There was no study on stromatolite phosphorite deposit in the upper Dengying Formation before. Therefore, our new finding of the stromatolite phosphorites in the Dengying Formation not only adds new phosphorite prospecting ores, but also a new phosphorite

ore-bearing type in this region (stromatolite phosphorites). In addition, it is notable to pay attention to phosphorite prospecting and study of the upper Dengying Formation in the Wengfu Area.

During the period of Dengying of the Late Ediacaran, a great amount of phosphorous-rich seawater brought by upwelling ocean currents moved to restricted subtidal lower energy environments at the edge of the Central Guizhou Uplift. Then homonemeae grew rapidly and produced numerous compounds which gradually turned the water environment into Organic Reefs. As a result, phosphate minerals agglomerated and began to precipitate through complex biological and biochemical actions and formed stromatolite phosphorites.

