

EARLY LITHIFICATION OF CAMBRO-ORDOVICIAN CARBONATES: THE EXAMPLE FROM FLAT-PEBBLE CONGLOMERATES IN KOREA AND CHINA

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Abundant flat-pebble conglomerates (FPCs) occur in Cambro-Ordovician carbonate strata in Korea. FPCs are clast-supported calcirudite, characterized by flat-shaped intraclasts. In Korea FPCs are classified into three lithologic types based mainly on the lithology of intraclasts and underlying strata. Among them Fp-1, which consists of well-rounded micrite intraclasts overlying nodular limestone, constitutes about 90% of FPCs. Based on textural observation and carbon isotope analysis, nodules were formed in sulphate reduction zone of early diagenetic stage, several tens of cm below the seafloor. The similarity of shape, size and lithology of nodules and the intraclasts of the overlying Fp-1 suggests that intraclasts were derived from underlying nodules of nodular limestone. Through the subaqueous erosion of argillaceous materials by storm waves, nodules were exhumed out of nodular limestone and accumulated on the nodular limestone to form Fp-1. Abundant features indicate very early submarine lithification of carbonates in Late Cambrian to Early Ordovician time in Korea. Considering the abundant occurrence of FPCs in Cambro-Ordovician strata worldwide, there might have existed certain conditions that enhanced early lithification of carbonates. To prove this speculation, we documented Cambro-Ordovician carbonates in China and confirmed early lithification of carbonates. Peloidal and stromatolitic laminations related with FPCs are observed. Thus bacterial induced lithification might played an important role in carbonate lithification enhancing sea during the Cambro-Ordovician time.