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Calcified algae and bryozoans from the Ordovician - Silurian successions of the Spiti Himalaya, India

Shivani Pandey and Suraj Kumar Parcha
Wadia Institute of Himalayan Geology, Gen. Mahadeo Singh Road, DehraDun-248001

The Tethys Himalaya contains an extensive record of sediments ranging from Precambrian to Cretaceous. These successions are well exposed in Pin, Parahio, Kunzum La and in the Takche sections. The present work is focused on the Ordovician and Silurian succession in the Pin Valley. The Ordovician succession consists of purple coloured quartzite, shale, siltstone, grits, dolarenites etc. Whereas, the Silurian succession comprises of thick sequence of slate, dolomite, calcarenites, olive green shale, limestone and pink dolomite. Both the successions contain a rich assemblage of the microfossils along with other body fossils. These successions show a wide variety of marine calcareous algae, along with corals and bryozoans. The calcified algae and bryozoans reported from the Ordovician - Silurian succession are mostly in carbonate beds. The various genera of bryozoan identified are as Calloporella, Cyphotrypa, Dekayai, Eridotrypa, Insignia, Trematopora, etc. along with them are various forms of calcified algae which were found in association in the same thin sections. The prominent genera of calcified algae are as: Dasyporella, Moniliporella, and Vermiporella. The algal assemblages mainly consist of the order Dasycladales, which predominants in the entire successions. Three genera of Dasycladacean algae were identified, among them genus Moniliporella was reported first time from the Pin section. The presence of bryozoans and calcified green algae in these successions indicates shallow marine to near shore environmental conditions followed by different stages of regression and transgression during this time span. Based on the faunal elements, middle to late Ordovician age can be assigned to Thango Formation and late Ordovician to late Silurian to the Takche Formation.The bryozoan communities identified indicates a correlation with that of southern China, Russia, Siberia, Kazakhstan and Mongolia. The genera Insignia and Tremaptopora which are reported from the Spiti Basin are also reported from the Ordovician successions of Russia. The earlier Bryozoan fauna reported from India from Kinnaur Basin were assigned late Ordovician age but the recent studies show that they go up to late Silurian and are equally present in Thango as well as in the Takche formations of this region. The calcified algae can be correlated at generic level with parallel successions of the Kinnaur Basin and also with the other well-known sections of the world. Apart from Spiti Basin, the genus Dasyporella is reported from middle to late Ordovician successions of the Tarim Basin in China, eastern Kazakhstan, Utah, Nevada, Norway and from Silurian successions of northern California. The genus Vermiporella which is also one of the dominating genera in the Spiti Basin is equally reported from the Ordovician successions of the Tarim Basin China, eastern North America, Baltic region, Poland, Scotland. This forms is equally reported from Silurian successions of Netherlands, Sweden and in India from the Kinnaur Basin. The genus Moniliporella which was reported first time from Spiti Basin by the authors shows an age ranges from late Ordovician to early Silurian. It has been found that even in Tarim Basin Moniliporella is having the same age range as that of the Spiti Basin as well as that of Kazakhstan. The studied microfaunal assemblage of Spiti Basin shows a cosmopolitan nature and is correlatable to other well known successions of the world.