

Sedimentology of the Lockhart limestone (Paleocene), Changlagali area, Nathiagali-Murree Road, Hazara, N. Pakistan

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The Lockhart Limestone of Paleocene age in the Changlagali area of Galiat is studied and described. The limestone is predominantly nodular, highly fossiliferous, with thin clay interbeds and is 120 m thick. The biotic assemblage is dominated by small and large benthic foraminifers with planktonic foraminifers, gastropods, mollusks, ostracodes and dasycladacean algae. It has conformable lower and upper contacts with the Hangu and Patala formations (Paleocene) respectively.

On the basis of detailed field and petrographic characteristics, four microfacies with distinct textures, allochem types, fossil contents and sedimentary structures are identified and interpreted. The microfacies include 1) Algal-Foraminiferal Packstone Microfacies (Inner shelf), 2) Mixed Bioclastic Packstone Microfacies (Middle shelf), 3) Benthic foraminiferal Wacke-Packstone Microfacies (Mid-Outershelf) and 4) Planktic-Benthic Foraminiferal Wacke-Packstone Microfacies (Outershelf).

The limestone represents deposition in a warm, low energy, restricted to normal salinity of the carbonate shelf. The cyclic repetition of the microfacies indicate changing depositional conditions as a consequence of sea level rise and fall.

The diagenetic fabric recognized in the limestone reveal mechanical and chemical compaction, deep burial-related pressure dissolution and tectonically-induced fractures with spar fillings. The nodular fabric of the limestone is mainly attributed to pressure dissolution phenomenon.