

MICROFACIES, DIAGENETIC FABRIC AND DEPOSITIONAL ENVIRONMENT OF THE MIDDLE JURASSIC SAMANA SUK FORMATION AT TARNAWAI SECTION, DISTRICT ABBOTTABAD, PAKISTAN

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Abstract

A detail sedimentological investigations of the Middle Jurassic Samana Suk Formation at Tarnawai Section, District Abbottabad, Pakistan was carried out to elaborate its microfacies, diagenetic fabric and depositional environment. Thirty two rock samples were petrographically studied from a 169 m thick section and four microfacies with nine sub microfacies were identified. The microfacies includes; 1. Grainstone microfacies (i.e. ooidal Peloidal-bioclastic grainstone, Peloidal-bioclastic grainstone and Peloidal grainstone as submicrofacies), 2. Packstone microfacies (i.e. Peloidal-Intraclastic Packstone and Peloidal packstone as submicrofacies), 3. Wackestone microfacies (i.e. Peloidal wackestone and bioclastic wackestone as submicrofacies) and 4. Mudstones microfacies (i.e. Peloidal siliciclastic mudstone and Planktonic mudstone as submicrofacies). The depositional environment depicted is high energy sand shoals, bar, or beach for Grainstone microfacies, inner shelf with moderate water circulation for Packstone microfacies, lagoonal settings with open and restricted circulation for Wackestone microfacies and low energy environment like lagoon and on outer shelf for Mudstone microfacies. A variety of cement morphologies and diagenetic imprints have been witnessed which are applied in diagenetic setting identification. Diagenetic features like stylolites, calcite veins, micritic envelopes, micro faults, fractures, broken grains and formation of ferroan calcite and dolomite have been observed. Varying degree of dolomitization has been developed at various levels within the formation. Based on the microfacies analysis the Samana Suk Formation at Tarnawai section represents gently sloping inner to outer carbonate shelf environment of deposition.