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# Microfacies and depositional environments of the Jurassic to Paleocene carbonates in the Kharzan area, Khuzdar, Balochistan

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The Kharzan area lies in the Central Kirthar Range of the Kirthar Fold and Thrust Belt. It exposes a thick Jurassic to Eocene stratigraphic sequence comprised of carbonates and clastics. The sequence is represented by Chiltan, Mazar Drik, Goru, Parh, Moru, Ranikot, Dungan, Ghazij, Kirthar, Nari and Gaj Formations in ascending order. As a part of this study, lithostratigraphic relationships of the units are recognized. Detailed sedimentology of the exposed carbonate units is based on logging and sampling of measured stratigraphic sections in the entire area. Detailed petrographic studies are carried out to identify and interpret microfacies of the sequence.

The oldest exposed sequence in the area is represented by massive to thick bedded, dark to light gray, Chiltan Limestone of Jurassic age. The limestone is measured and described from Chutok Nala and Pironi Nala in the Kharzan, district Khuzdar, Balochistan, where the base of the unit is not exposed and it is 300 and 200 m thick respectively. The top of the Chiltan is a major unconformity marked by subaerial exposure surface with karstified solution breccia. Six microfacies comprised of 1) Ooidal Grainstone, 2) Peloidal, bioclastic Packstone, 3) Dolomitic Grainstone, 4) Peloidal Packstone, 5) Micropeloidal Wacke-Packstone and 6) Dolomitic Mudstone are recognized. These microfacies are interpreted to represent deposition under a shallow shelf environments marked by sea level-induced periodic changes in energy conditions. The Chiltan deposition is followed by emergence of the carbonate platform with the development of paleokarst related solution breccia.

The Parh Limestone of Cretaceous age overly the Goru Formation and is a thick sequence of thin-bedded, papery laminated micritic limestone with planktonic foramanifers like *Globotruncana fornicate*, *Globotruncana sigali*, *Globotruncana concavata* and represent deposition in a deeper outer shelf.

The Paleocene sequence is represented by the Dunghan Limestone. The formation is 130 m thick in Chutok Nala and is comprised of two distinct lithological units; the lower unit is medium-bedded limestone with interbeds of clinoforms of massive, carbonate breccia, while the upper unit is thin bedded, fossiliferous limestone. Five microfacies identified in the Dunghan Limestone are; 1) Mixed Bioclastic, Algal Packstone, 2) Foram-Algal Grainstone Microfacies, 3) Coarse Lithoclastic Microfacies, 4) Microbioclastic Planktic Wacke-Packstone Microfacies, 5) Peloidal Wacke-Packstone Microfacies. The microfacies interpretation shows that the Dunghan Limestone represents deposition in a carbonate ramp with deepening upward trend.