

Revised stratigraphy of Balochistan Basin, Pakistan

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Abstract

The Balochistan basin is subdivided into Chagai-Raskoh-Wazhdad magmatic arc, Kakar Khorasan (back arc) and Makran (fore arc; arc-trench gap) basins. The revised Stratigraphy of Kakar Khorasan basin includes Cretaceous-Paleocene Nisai Group (=2000m thick) comprises of Akhtar Nika Formation (alternated limestone and shale; 1000-1500m thick), Jabrai Formation (mudstone/shale with alternation of thin marl/limestone beds; 500-1000m thick) and Nisai Formation (mainly two massive limestone unit separated by shale unit; 100m thick), Paleocene-Eocene Shagala Group consists of Murgha Faqirzai Formation (shale, 2000m thick), Mina Formation (alternation of green shale unit and sandstone unit; 3000m thick) and Shagala Formation (=Shagalu; alternation of terrestrial red shale unit and sandstone unit; 3000m thick), Oligocene-Pliocene Vihowa Group (synonyms; Malthanai/Dasht Murgha group) represents Chitarwata, Vihowa, Litra and Chaudhwan formations and Pleistocene-Holocene Sakhi Sarwar Group (Boston formation) represents Dada and Sakhi Sarwar Formation (mud and sandstone with poorly developed conglomerate, while in centre of valleys the mud is dominant) concealed at places especially in the valleys and plain areas by the Subrecent and Recent fluvial, eolian and colluvial deposits. The Nisai Group is correlated with Early Cretaceous Parh Group, Late Cretaceous Fort Munro Group and Paleocene Sangiali Group (Sangiali, Rakhi Gaj and Dungan formations) of Sulaiman basin. The Shagala Group is correlated with Chamalang (Ghazij) Group and Kahan Group of Sulaiman basin. The southern part of Kakar Khorasan basin shows flysch deposition like Murgha Faqirzai Shale and Mina Formation (green shale and sandstone) while the northern part of Kakar-Khorasan basin shows both these formations as flysch deposition while the middle-Late Eocene Shagala (Shaigalu) Formation (sandstone and red to maroon, brown shale and sandstone) as terrestrial/molasse deposits which is supported by continental rhinoceros-baluchitherium mammal fauna. The Chagai-Raskoh-Wazhdad magmatic arc shows the Cretaceous Chagai intrusions which is invaded by Sinjrani Volcanic Group (=Kuchaki), Cretaceous-Paleocene Nisai Group includes Akhtar Nika and Jabrai formations (Synonyms; Humai and Rakhshani formations and Nisai Limestone (Synonyms; Robat/Kharan/Wakai limestones); Late Paleocene-Early Eocene Shagala Group includes Murgha Faqirzai and Mina formations (synonyms; Khojak/Saindak/ Washap/Amalaf formation), Late Eocene Shorkoh intrusions, Washuk Intrusions (granite exposed in the southern part of western Washuk range), Wazhdad Volcaniclastics Group and Washuk ophiolite, Oligocene-Pliocene Pishi Group (=Vihowa group), Middle Miocene Buze Mashi Koh volcanic group, Late Pliocene to Pleistocene Koh-i-Sultan Volcanic Group and Pleistocene-Holocene Sakhi Sarwar (Kamerod/Boston/Kech) Group, Subrecent and Recent fluvial, eolian and colluvial deposits. The Makran basin show the Cretaceous-Paleocene Nisai Group includes Akhtar Nika and Jabrai formations (Parh like limestone near Mand) and Nisai limestone (Wakai limestone), Late Paleocene-Early Eocene Shagala Group includes Murgha Faqirzai Shale (Siahan shale, Zurati shale and sandstone; Hoshab shale), and Mina Formation (Panjgur sandstone and shale), Oligocene-Pliocene Talar (=Vihowa) Group (Parkani mudstone, Talar sandstone and Chatti mudstone), and Pleistocene-Holocene Sakhi Sarwar Group.