

**LITHOSTRATIGRAPHY, ECONOMIC AND VERTEBRATE SIGNIFICANCE OF
FORT MUNRO ANTICLINORIUM, DERA GHAZI KHAN AND RAJANPUR
DISTRICTS OF PUNJAB AND DERA BUGTI AND BARKHAN DISTRICTS OF
BALOCHISTAN, PAKISTAN**

M. Imran Alyani¹ and M. Sadiq Malkani²

¹*Geological Survey of Pakistan, Lahore*

²*Formerly with Geological Survey of Pakistan, C/O Post Office Retra, Tehsil Taunsa, District D.G.
Khan*

imranalyani_dgk@yahoo.com

Abstract

Doubly plunging Fort Munro anticlinorium is located in Eastern Sulaiman Foldbelt. The oldest rock exposed in Shadiani Gorge is Early Cretaceous Parh Limestone. The Late Cretaceous Mughal Kot (marl/mudstone and sandstone), Fort Munro Limestone and Pab Sandstone, and Latest Cretaceous Vitakri Formation (sandstone and red muds) of Fort Munro Group are exposed in the Shadiani, Rakhi Gaj and other gorges as core strata. The tourism places and peaks (about 2000m AMSL) are Fort Munro and Mari. The North-South trending peak consists of exposed Paleocene Sangiali Limestone (a few meter thick), Rakhi Gaj Formation (more than 100m of Girdu ferruginous sandstone and Bawata shale) and Dungan Limestone of Sangiali Group. At places the exposures of Pab Sandstone and Vitakri Formation (host of dinosaurs and associated vertebrates which are found just below the K-T boundary) are exposed in the areas of Mian Ghundi, Fort Munro, Chitri and on both limbs of anticlinorium. The eastern and western limb formations are Early Eocene Shaheed Ghat (shale), Drug (rubbly limestone), Baska (gypsum and shale) of Chamalang (Ghazij) Group and Middle Eocene Habib Rahi Limestone, Domanda shale, Pirkoh marl/limestone and Drazinda shale of Kahan Group, Oligocene Chitarwata (ferruginous sandstone, conglomerate and shale), Miocene Vihowa (red muds and sandstone) and Litra (greenish grey sandstone with some red muds) and Pliocene Chaudhwan (alternated sandstone and maroon muds) of Vihowa Group and Pleistocene Dada (conglomerate) and Holocene Sakhi Sarwar (clays, sandstone and conglomerates) of Sakhi Sarwar Group. The eastern limb shared with Barthi-Baghal Chur Syncline and western limb shares with Beaker, Mat Khetran, Chacha, Rakhni and Manjhail Kharar Syncline. The Paleocene and post Paleocene rocks plunge in the south at Mari and Kalchas and in the north at Hinglun-Sora Tangi. Due to plunge the trends of Paleocene to Holocene rocks shifted from north-south to gradually east-west forming arc in the southern and northern plunge areas. In the south after the plunge the main structures found are Sui, Zin, Uch, Loti, Pir Koh, which produce petroleum/gas. The significance of this anticlinorium is many economic commodities and paleontological findings. The economic mineral commodities are fuller earth, gypsum and other cement raw materials like limestone and shale, building stone and construction materials like Dungan Limestone and some beds of Habib Rahi Limestone and conglomerates of Pleistocene Dada and Holocene Sakhi Sarwar formations, millstone and quartzite from Pab, iron from Chitarwata and Girdu member or Gorge beds of Rakhi Gaj formations. This iron may be used for cement/steel industry like the Satta Post red mud which is being used by D.G.Khan Cement Industry. Some coal showings are also tried for mining in the Domanda and Chitarwata formations in the eastern limb but now minings are abandoned. Recently the most famous vertebrates reported are dinosaurs (Titanosaurian sauropods facies and abelisaurian and Noasaurian theropods facies), mesoeucrocodyles and pterosaurs-the flying reptiles, Middle Eocene walking whale, the king of basal whales (*Sulaimanitherium dhanotri*), Oligocene Baluchitheria-the largest land mammals (*Baluchitherium osborni* and *Buzdartherium gulkirao*) and crocodile (*Asifcroco retrai*) and Miocene large proboscideans (*Gomphotherium buzdari*).