

Sandstone and conglomerate petrology of the Neogene succession, Pishin Belt, northwestern Pakistan

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The siliciclastic Neogene succession of the Pishin Belt comprises the newly proposed Miocene Dasht Murgha Group, Miocene-Pliocene Malthanai Formation and Pleistocene Bostan Formation which were deposited as fluvial succession in the foreland setup. Thin section studies and modal analyses revealed that sandstones of the Dasht Murgha Group and Malthanai Formation are lithic arenite and show recycled and transitional recycled orogenic source. Sandstone detritus has been derived mainly from the sedimentary and metamorphic terrains, sedimentary rocks being a more pronounced source terrain than the metamorphic rocks, particularly in the Malthanai Formation, however, the volcanic terrain has also provided its detritus but in minor proportion. Composition of conglomerate of the Dasht Murgha Group, shows that the Eocene Nisai Group and Oligocene Khojak Formation are the main source terrains, whereas, the Jurassic Loralai Formation and Muslim Bagh-Zhob ophiolite are the subordinate source terrains. Conglomerate of the Malthanai Formation shows similar composition with additional contribution from the Dasht Murgha Group. Conglomerate of the Bostan Formation shows that its detritus has mainly been derived from the Nisai Formation, Khojak Formation, Muslim Bagh-Zhob ophiolite, as well as Dasht Murgha Group and Malthanai Formation. Detritus of the Triassic Wulgai Formation, Jurassic Loralai Formation and Cretaceous Parh Limestone has also contributed in subordinate amount. Detrital modes of the sandstones and petrology of the conglomerates show that the detritus for the Neogene succession has mainly been derived from the Pre-Miocene sedimentary and meta-sedimentary terrains of the Pishin Belt from the west, which include Eocene Nisai Formation and Oligocene Khojak Formation; and Sulaiman Belt from the east, which include Triassic Wulgai Formation, Jurassic Loralai Formation and Cretaceous Parh Limestone. Also mafic and ultramafic detritus has been provided by the Muslim Bagh and Zhob ophiolite exposed along the western margin of the Indian Plate.