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REFERENCES

- [1] Middlemiss, C.S. 1896. The geology of Hazara and black mountains. Geological Survey of Pakistan, 26, 302.
- [2] Danilchik, W., Shah, S.M.I. 1961. Stratigraphic nomenclature of formations in Trans-Indus Mountains, Mianwali District, West Pakistan. U.S. Geological Survey Professional Paper Report (IR) PK-33, 45.
- [3] Shah, S.M.I. 1977. Stratigraphy of Pakistan. Geol., Surv. Pakistan. Mem., 12, 138.
- [4] Calkins, T.W., Offield, Ali, S.T. 1969. Geology and mineral resources of southern Hazara District, West Pakistan, and parts of western Azad Kashmir, Prof. Report (IR) PK-43, 92.
- [5] Fatmi, A.N. 1977. Stratigraphy of Pakistan. Geological Survey of Pakistan, 12, 29-56.
- [6] Stoliczka, F. 1866. Summary of geological Observations during a visit to the provinces – Rupshu, Karnag, South Ladak, Zanskar, Suroo and Dras – of Western Tibet, 1865. Memoirs of the Geol., Surv. India. Mem., 5, 173.
- [7] Latif, M.A. 1970c. Micropalaeontology of the Galis Group, Hazara, West Pakistan. Geological Map. Wein Jb. Geol., B. A., Sonderb, 15, 63-66.
- [8] Ali, R., Ahsan, N., Chaudhry, M.N., Masood, K.R. 2000. Lithofacies, Microfacies, diagenesis, Environment of Deposition and Palynology of Lumshiwai Formation at Kundla, Hazara Basin, Pakistan. Third South Asia Geological Congress, Lahore, Pakistan, 155.
- [9] Ahsan, N., Chaudhry, M.N. 1999. Sedimentology of Lumshiwai Formation, Attock Hazara Fold and Thrust Belt, NW Lesser Himalayas Pakistan. In Terra Nostra, 14th Himalaya-Karakoram-Tibet Workshop, Germany, 4-5.
- [10] Ahsan, N., Chaudhry, M.N., Khawaja, A. 2001c. Tithonian to Danian Sedimentation in Hazara Basin, Northern Pakistan. Nepal Geological Congress. No paging.
- [11] Rustam, M.K., Ali, M. 1994. Preliminary Gravity Model of Western Himalayas in northern Pakistan. Kashmir. J. Geol., 11 (12), 59-65.
- [12] Crawford, Davies, R.G. 1975. Ages of Pre-Mesozoic of the Lesser Himalaya, Hazara district, Northern Pakistan. Geological Magazine, 112, 509-514.
- [13] Haque, A.F.M.M. 1956. The smaller Foraminifera of the Ranikot and the Laki of the Nammal Gorge, Salt Range. Geological Survey of Pakistan, 1, 300.
- [14] Iqbal, M.W.A. 1972. Bivalve and gastropod fauna from Jherruk-Lakhra-Bara Nai (Sindh), Salt Range (Punjab) and Samana Range (NWFP). Geological Survey of Pakistan, 9, 104.
- [15] Wells, N.A. 1987. Paleoenvironmental Interpretation of Paleogene strata near Kotli, Azad Kashmir, Northeastern Pakistan. Kashmir J. Geol., 5, 23.
- [16] Bossart, P., Dietrich, D., Greco, A., Ottiger, R., Ramsay, J.G. 1988. The tectonic structure of the Hazara Kashmir Syntaxis southern Himalaya, Pakistan. Tectonics, 7, 273-297.
- [17] Greco, A. 1991. Stratigraphy, metamorphism and tectonics of the Hazara Kashmir Syntaxis area. Kashmir J. Geol., 8 (9), 39-66.
- [18] Baig, M.S., Munir, H.M. 2007. Foraminiferal biostratigraphy of Yadgar area Muzaffarabad Azad Kashmir, Pakistan. Journal of Himalayan Earth Sciences, 40, 33-40.
- [19] Blatt, H., Tracey, R.J. 1996. Petrology, Igneous, Sedimentary and Metamorphic, 2nd ed., W. H. Freeman Publisher, New York, 497.
- [20] Shah, S.M.I. 2009. Stratigraphy of Pakistan. Geol., Surv. Pakistan. Mem., 22, 381.
- [21] Folk, R.L. 1974. Petrology of sedimentary rocks, 2nd ed. Hemphills press, Austin, TX.182.
- [22] Pittman, E.D. 1970. Plagioclase feldspar as an indicator of provenance in sedimentary rocks. Journal of Sedimentary Research, 40, 591-598.
- [23] Dickinson, W.R., Bread, L.S., Breckenridge, G.R., Erjavec, J.L., Ferguson, R.C., Inman, K. F., Knepp, R.A., Lindberg, Ryberg, P.T. 1983. Provenance of North American Phanerozoic sandstone in relation to tectonic setting. Bull. Geol., Soc. America., 94, 222-235.

