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ABSTRACT BOOK

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Le geoscienze fra passato e futuro



Preliminary stratigraphic and petrological data on the Durkan Complex (Makran accretionary wedge, SE Iran)

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The Makran Accretionary Prism (SE of Iran) resulted from the northward subduction of the Neo-Tethys Ocean below the Lut and Afghan continental blocks, associated with the Cretaceous – Present day convergence between the Arabian and Eurasian Plates. The North Makran is the innermost structural domain of this accretionary prism. In the North Makran, the Bajgan and Durkan Complexes consist of a Paleozoic metamorphic basement and its sedimentary cover, respectively, and are thought to represent a continental margin domain. The Durkan Complex is made up of several tectonic units mainly consisting of Early Cretaceous – Paleocene carbonatic and volcanic successions, as well as rare Carboniferous, Permian and Jurassic slices of platform limestone. However, the stratigraphic succession, and the age and geochemistry of the volcanic rocks are poorly known. Nevertheless, such data are necessary for constraining the meaning of the Durkan Complex in the geodynamic evolution of the Makran.

We therefore present preliminary stratigraphic and petrological data on the Durkan Complex in the western sector of the North Makran. Here, it consists of different tectonic slices, which are characterized by hundreds of metres-thick stratigraphic successions whose features range between two end-members. The first type of succession is characterized by pillow and massive lava flows intercalated with silicified limestone, radiolarian chert and shale, as well as alternating volcanoclastic sandstone, shale and minor limestone. The second type of succession is characterized by pillow lava flows, volcanic breccia, as well as volcanoclastic sandstone and coarse-grained limestone, overlain by a carbonatic platform succession consisting of grainstone, recrystallized wackestone, and lenticular bodied of carbonatic breccia. The platform lithofacies are followed by alternating silicified limestone and shale. These first and second end-member successions represent relatively deep and relatively shallow sedimentary deposition, respectively. However, volcanic rocks in all the different successions of the Durkan Complex show very similar geochemistry and overall features. In fact, they mainly consist of alkaline basalt and minor trachybasalt, trachyandesite and trachyte, showing high Nb/Y ratios (0.62 – 4.4) and marked enrichment in LREE compared to HREE. In addition, preliminary biostratigraphic data on the limestone and chert stratigraphically associated with the volcanic rocks show foraminifera and radiolarian assemblages of Late Cretaceous age.

Our preliminary data suggests that a significant alkaline magmatic pulse occurred in the Late Cretaceous in the Makran sector of the Neo-Tethyan Eurasian realm. This volcanism was likely associated with rift activity possibly related, in turn, to mantle plume activity or regional scale mantle heterogeneities. Its tectono-magmatic significance within the Makran geodynamic evolution is then worth to be further investigated in detail.