Goldschmidt 2026 Abstract
https://doi.org/10.46427/gold2026.33932

Holocene environmental changes in the southern Thar dunes along the Rann – Thar interphase, based on multi-proxy study of dune sands.

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This study examines five dune field locations in the Rann-Thar interphase to determine the morphology, texture, composition, mineralogy, geochemistry, and origin of the sand dunes. These sand dunes have linear, parallel, and subparallel ridges in their morphology. From these various kinds of sand dunes, eighteen samples were taken. In general, the sands from dunes in every site had a mean grain size that ranged from fine sand to very coarse silt, were very poorly sorted to moderately well sorted, and had near very fine skewed to symmetrical skewness with very leptokurtic, platykurtic and mesokurtic distribution. Skewness and kurtosis distribution characterize sand dunes named as BKSR-OP, BKSR-SATA, KMR-A, KMR-B and RH where sand dunes all show of subangular grains. The sand dunes are composed of quartz, feldspar, and calcite. Quartz dominates the mineralogy of all sand dunes, although significant amounts of feldspars are found in KMR-B. While calcite is present in sand dunes at KMR-B and BKSR-OP. Basement-related sand dunes at BKSR-OP and BKSR-SATA are mineralogically sub-mature to moderately mature. However, non-basement sand dunes at RH dune site are mature. Both petrograph and geochemical analyses of sand dunes indicated that most sand dunes are classified as quartz arenite dominant. Moreover, major, trace, and rare earth elements indicated the Thar Desert represents a passive continental margin to intra-cratonic tectonic setting, not an active continental margin for sand dunes along the Rann- Thar interphase.