

# **Patterns of dune form and colouration in the Al Dahna sand seas in the north of Al Qassim Area**

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## **Abstract**

The Al Dahna sand seas around Qassim province in central Saudi Arabia show spatial variation in the dunes morphology and color. This variation is related to different factors, including: sediment sources, spatial variations caused by chemical weathering, dune type, topographic and paleo winds.

A field investigation was undertaken, involving collecting samples from different parts of the sand dunes; this was later combined with laboratory analysis and remote sensing methods, so as to provide direct indicators of sand distribution and calcification.

The results showed that the high concentration of red colouring and redness rating, as well the magnetic estimate, was generally greater towards the south of the Wadi Al Ajradi channel, in the north western areas of Al Dahna and in most dome and star dunes as well as in the high linear dune systems, due to the high concentration of hematite. There was a low concentration of red colouring and redness rating, as well magnetic estimates, towards the channel of the Wadi Al Ajradi, in the north eastern areas of Al Dahna and in most interdune areas; as well as near to the low linear dune systems located to the east of Nafud Al Hamail and Aum Anqi. This was due to the low concentration of hematite and an increase in the amount of calcite, gypsum and evaporate sediments.