

The aeolian Triassic rift fill sediments at Red Head, Five Islands, Nova Scotia, Canada

KENNETH MARTYNS-YELLOWE, DARRAGH E. O'CONNOR, RICARDO L. SILVA, AND GRANT D. WACH
*Dalhousie University, Basin and Reservoir Lab, Department of Earth Sciences, Life Sciences Centre,
Halifax, Nova Scotia B3H 4R2, Canada*

We examine the outcrop sedimentological, mineralogical, and geochemical characteristics of the Late Triassic Red Head Sandstone Member (RHS), Wolfville Formation, located at Five Islands Provincial Park, Nova Scotia. The RHS comprises approximately 33 m of red quartzitic sandstone interpreted as an aeolian dune field complex deposited in an arid to semi-arid environment. The type section is an amphitheatre with complete internal 3D visualization of the succession. The aeolian strata overlie alluvial/fluviol sandstone of the Carnian Wolfville Formation and are overlain by playa lacustrine mudstone of the Norian Blomidon Formation.

In Mesozoic rift basins along the Eastern North American Margin, this interval is one of the only locations which exhibits the transition between the major alluvial/fluviol and lacustrine rift fill succession. Previously regarded as the uppermost unit of the alluvial/fluviol Wolfville Formation, recent biostratigraphic work revised the RHS as the lowermost member of the playalacustrine Blomidon Formation.

This work integrates comprehensive literature review, outcrop sedimentological observations, and petrographic thin section and preliminary geochemical analysis of hand samples to classify the RHS. Preliminary distinction of lithic characteristics between the RHS and adjacent lacustrine strata of the Blomidon Formation result from mineralogical and X-ray fluorescence (XRF) analysis. Despite similarities in paleoclimate, preservation of thick aeolian sandstone is generally uncommon elsewhere along the Eastern North American Margin, but sedimentological and stratigraphic similarities can be drawn with preserved aeolian sandstones in the Argana Basin, Morocco.

Like its correlative section the Tadrat Ouadou Member of the Bigoudine Formation, Morocco, the RHS sits on an angular unconformity. Both aeolian sandstones are extensive, which may be attributed to their proximity to the sand source. Preservation of both strata may be linked to a high paleo-water table, useful indication of a shift away from arid conditions in the Late Triassic into more humid Jurassic conditions. These results indicate the role of climate in the localization of these dune sequences in their respective tectonostratigraphic framework as well as their importance for constraining Pangaeon paleoclimatic models.