

EVAPORITE DISSOLUTION IN THE NORTH CURRY SANDSTONE MEMBER (DUNSCOMBE MUDSTONE FORMATION, LATE TRIASSIC MERCIA MUDSTONE GROUP), TAUNTON DEANE (SOMERSET), S. ENGLAND



A. RUFFELL¹, M. BENTON², M.J. SIMMS³, M.E. TUCKER² AND P.B. WIGNALL⁴

Ruffell, A., Benton, M., Simms, M.J., Tucker, M.E. and Wignall, P.B. 2018. Evaporite dissolution in the North Curry Sandstone Member (Dunscombe Mudstone Formation, Late Triassic Mercia Mudstone Group), Taunton Deane (Somerset), S. England. *Geoscience in South-West England*, **14**, 188–193.

Four new outcrops of the North Curry Sandstone Member (Dunscombe Mudstone Formation, late Triassic) are described. Data derived from this formation have, in previous publications, formed a central part of the theory of increased humidity during this time, with arid facies occurring above and below through the rest of the Mercia Mudstone Group (late Triassic). Each of the four of the outcrops show unusual facies including dissolution breccias and halite crystal pseudomorphs. These features appear to contradict the widely-held view of a humid phase at this time: the North Curry Sandstone Member may have eroded down into underlying evaporites through basin-margin onlap and erosion.

¹ School of the Natural and Built Environment, The Queen's University, Belfast BT7 1NN, Northern Ireland, U.K.

² School of Earth Sciences, University of Bristol, Wills Memorial Building, Bristol BS8 1RJ, U.K.

³ Department of Natural Sciences, National Museums Northern Ireland, 153 Bangor Road, Cultra, Holywood BT18 0EU, Northern Ireland, U.K.

⁴ School of Earth & Environment, University of Leeds, Leeds LS2 9JT, U.K.

Keywords: Triassic, Mercia Mudstone Group, evaporites, palaeoclimate

INTRODUCTION

We report on new exposures of the late Triassic North Curry Sandstone Member (Dunscombe Mudstone Formation) west and east of Taunton (Somerset). This sandstone and grey mudstone unit interrupts a succession of predominantly red calcareous and evaporite-bearing mudstone of the under- and overlying Mercia Mudstone Group. As such it has been claimed that it represents a period of global humidity (Carnian Stage, late Triassic) termed the Carnian Pluvial Episode or Carnian Humid Phase (Ruffell *et al.*, 2016). The theory of the Carnian Humid Episode was initiated by a study (by AR) of sandstone exposures that are adjacent to those newly described herein, making these small, and seemingly insignificant exposures of global significance. Our work (below) describes evaporite dissolution features such as solution breccias and halite pseudomorphs, indicative of evaporation: a paradox that needs to be clarification.

LATE TRIASSIC STRATIGRAPHY OF THE WESTERN WESSEX BASIN (INCLUDING THE MENDIP HILLS, POLDEN HILLS AND TAUNTON DEANE)

The stratigraphy of the Mercia Mudstone Group in the western Wessex Basin, and in adjacent areas to the north, shows considerable similarities throughout. It comprises a tripartite formational stratigraphy, with minor, laterally impersistent formations and members within. Both Howard *et al.* (2008) and Gallois and Porter (2006) provide a stratigraphical nomenclature: the latter is used herein, although

the former is referred to as appropriate. The Dunscombe Mudstone Formation includes the (calcareous) Lincombe Member, and the arenaceous North Curry and Sutton Mallet/Butcombe sandstone members: the subject(s) of this work. In basin-centre successions, the Somerset Halite Member of Howard *et al.* (2008), has been encountered (e.g., in the Burton Row Borehole, in NE Somerset (Gallois, 2003, and references therein). In this borehole, a discrete horizon of Dolomitic Conglomerate was identified above the halite. Of note is Gallois and Porter's (2006, fig. 3) observations of 'breccia, angular clasts of variously coloured mudstones and limestones in a mudstone matrix': these show some similarities to the facies described below.

The Branscombe Mudstone Formation succeeds the Dunscombe Mudstone Formation and comprises the remainder of the red-bed dominated Mercia Mudstone succession. The calcareous mudrock of this formation show textural similarities to the red-bed parts of the underlying Sidmouth Mudstone and Dunscombe Mudstone but with one notable exception: the latter hosts halite, whereas the Branscombe Mudstone hosts only gypsum/anhydrite. Parts of, or the entire Mercia Mudstone Group succession pass laterally toward basin margins into either thin palaeosol deposits (such as in the east of the Wessex Basin, see Burley, 1984) dominated by lacustrine limestone-calcrete, shoreline successions (as seen in South Wales; see Tucker, 1977, 1978) or into marginal breccias and conglomerates typified by the so-called Dolomitic Conglomerate of the Mendips (Etheridge, 1870; Howard *et al.*, 2008).