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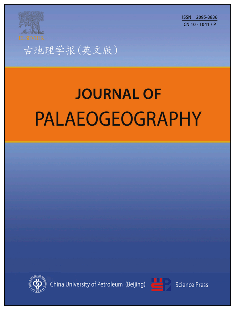

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PII: S2095-3836(17)30053-6

DOI: 10.1016/j.jop.2017.08.001

Reference: JOP 63

To appear in: *Journal of Palaeogeography*

Received Date: 16 May 2017

Revised Date: 28 July 2017

Accepted Date: 15 August 2017

Please cite this article as: Alberti, M., Pandey, D.K., Sharma, J.K., Swami, N.K., Uchman, A., Slumping in the Upper Jurassic Baisakhi Formation of the Jaisalmer Basin, western India: Sign of synsedimentary tectonics?, *Journal of Palaeogeography* (2017), doi: 10.1016/j.jop.2017.08.001.

Slumping in the Upper Jurassic Baisakhi Formation of the Jaisalmer Basin, western India: Sign of synsedimentary tectonics?

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Abstract A spectacularly exposed slump is described from a 120-m-long road cut between the villages of Kanod and Deva in the northeastern Jaisalmer Basin of Rajasthan, India. The Upper Jurassic part of the sediments at the outcrop was formed in a near-shore setting and belongs to the Ludharwa Member of the Baisakhi Formation. The 3-m-thick unit shows a number of asymmetric folds and thrust faults leading to an imbrication of partly lithified sandstone beds. The deformation structures allow the reconstruction of a movement towards the northwest. This agrees well with the basin configuration that shows a deepening into this direction. Although the determination of a specific trigger mechanism is difficult for soft-sediment deformation structures, an earthquake caused by synsedimentary tectonics in the basin seems to be the most likely explanation.

Keywords Sedimentology, Mass movements, Slumping, Soft-sediment deformation structures, Jaisalmer Basin, Jurassic

Received 16 May 2017; accepted 28 July 2017; available online xxx

1. Introduction

Soft-sediment deformation structures are ubiquitous features occurring within marine, lacustrine, fluvial, or terrestrial environments. Slumps (or slump sheets) are connected with the down-slope movement of a sediment mass and characterized by internal deformation (*e.g.*, reverse faults or folded beds; Allen, 1982; Owen *et al*., 2011). Such movements of poorly consolidated sediments have been frequently described from the geological record (*e.g.*, Alsop *et al*., 2016; Debacker *et al*., 2001; Karlin *et al*., 2004; Mastrogiacomo *et al*., 2012; Ortner and Kilian, 2016; Shanmugam *et al*., 1994) and can also be observed in the present (*e.g.*, Niemi and Ben-Avraham, 1994). Their formation is mostly attributed to a loss of shear strength of water-saturated, soft sediments due to sudden sedimentary overload, oversteepening of the slope gradient, sudden changes in wave action, or allogenic trigger mechanisms such as earthquakes or less commonly tsunamis and meteorite impacts (Allen, 1982; Chiarella *et al*., 2016; Garcia-Tortosa *et al*., 2011; Gladkov *et al*., 2016; Moretti *et al*., 2016; Obermeier, 1996; Owen and Moretti, 2011; Owen *et al*., 2011; Shanmugam, 2016). Other possible processes leading to slumps are often confined to special circumstances (*e.g.*, glacial loading, salt tectonics, and volcanic activity; Shanmugam, 2016). Slumps generated by earthquakes are also commonly named seismites (Seilacher, 1969), although the validity of

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Peer review under responsibility of China University of Petroleum (Beijing).
http://dx.doi.org/xxxxxx