A preserved Late Cretaceous biological soil crust in the capping sandstone member, Wahweap Formation, Grand Staircase-Escalante National Monument, Utah: Paleoclimatic implications

W.S. Simpson a, E.L. Simpson b,*, M.C. Wizevich c, H.F. Malenda b, H.L. Hilbert-Wolf d, S.E. Tindall b

a Parkland High School, 2700 North Cedar Crest Blvd., Allentown, PA 18104, USA
b Department of Physical Sciences, Kutztown University of Pennsylvania, Kutztown, PA 19530, USA
c Department of Physics and Earth Sciences, Central Connecticut State University, New Britain, CT 06050, USA
d Carleton College, Northfield, MN 55057, USA

ARTICLE INFO

Article history:
Received 27 May 2010
Received in revised form 21 July 2010
Accepted 22 July 2010
Available online 14 August 2010

Editor: B. Jones

Keywords:
Paleosols
Biological soil crusts
Cretaceous
Utah

ABSTRACT

Modern biological soil crusts develop under semiarid to arid conditions and are characterized by diverse communities of micro- and macro-organisms. The upper meter of the Upper Cretaceous capping sandstone member of the Wahweap Formation in Grand Staircase-Escalante National Monument, Utah contains an outcrop of an ancient biological soil crust preserved in matrix-rich quartz sandstone. The interpretation is based in comparison with modern biological soil crust analogs, specifically similarities in morphological expression, sorting, and proximity to associated eolianites. This study reports on this rarely recognized type of paleosol, a biological soil crust and discusses the sedimentologic and paleoclimatic implications.

© 2010 Elsevier B.V. All rights reserved.