



## **Development of a monocline in the northeast Sylhet Trough along the Dauki Fault, NE Bangladesh**

S. Biswas (1), G. Wiesmayr (2), B. Grasemann (3)

(1) Department of Geological Sciences, Jahangirnagar University, Savar, Dhaka 1342, Bangladesh (biswas.subrata@gmail.com), (2) Rohöl-Aufsuchungs AG, Schwarzenbergplatz 16, A-1015 Vienna (gerhard.wiesmayr@rohoel.at), (3) Department of Geodynamcis and Sedimentology, Univerisity of Vienna, Althanstrasse 14, A-1090, Vienna (bernhard.grasemann@univie.ac.at)

The southern margin of the Shillong Plateau is described as monoclinial flexures of the rock sequences in south of the Dauki Fault. Faulting is associated with folding in the Mesozoic and Tertiary rocks. Present studies achieved structural and geomorphic data in the NE corner of Sylhet Trough, a sub-basin of Bengal Basin, where nearly all Tertiary rocks of Bangladesh are exposed. The geologic cross sections and the field geologic data clearly show that all the formations are dipping southward forming a monocline at the Jaintiapur area. The sedimentary sequences are horizontal to sub-horizontal at the north of Dauki Fault where as it forms a monoclinial sequence of about 8km thickness just 16 km south of the fault. This indicates a huge deposition sink south of Shillong Plateau, increasing in the Sylhet Trough. Draping of sedimentary layers over the growing fault escarpment in the basement causes the tectonic forced folding and the fracture patterns in the cover sedimentary rocks. The calculated displacements of the basement along the Dauki fault at different areas are considerably differing suggesting differential movement along the fault. The displacement along the master Dauki Fault near the Tamabil area has been calculated ca.1000 m. Thus the relief of ca. 20 km between the basement of the Sylhet Trough and the exposed basement at Shillong has been accommodated through a series of step like faults parallel to the Dauki Fault, uplifting the basement successively from Sylhet Trough to Shillong. The mechanism of folding in the cover rock of NE Sylhet Trough has affected the evolution of the monocline, which was controlled by a few basement-rooted faults striking EW and NW-SE. A dynamic and kinematic model has been proposed for the evolution of the forced fold in the south of the Dauki Fault: an early extensional phase (rifting

stage), followed by a compressional phase (India-Eurasia collision stage) and finally by adding a transpressional phase (since India-Burma collision stage). Differential deposition and compaction of sediments on existing fault scarp developed during the rifting of the Gondwanaland in Permo-Carboniferous. This event was followed by draping of the sedimentary layers over existing faults which reactivated and inverted due to the change of tectonic regime during the collision of Indian Plate and Eurasian Plate. In this phase, the reactivation of existing faults started uplifting the northern part to form a southward local slope for the basement facilitating a depocenter in the present Sylhet Trough. During Miocene, the area experienced shortening from Burmese Plate in NW direction, modifying the tectonic regime into transpressional.