

## Differential Subsidence and Coal Formation in Early Permian Gondwana Sequences of Eastern-Central Peninsular India

Zahid A. Khan<sup>1</sup> and Ram Chandra Tewari<sup>2</sup>

<sup>1</sup>504, W.R. Apartments, 5, J.C. Bose Marg, Lucknow-226001, India

<sup>2</sup>Department of Geology, Sri J.N.P.G. College, Lucknow-226001, India

E-mail: zahid26aug@yahoo.co.in; ram\_tewari@yahoo.com

### Abstract

The variation in net subsidence in Early Permian Karharbari and Barakar Formations of Giridih and Korba Gondwana sub-basins of eastern-central India is analysed using interspecific association statistical technique between lithologic and stratigraphic variables. All possible pairs chosen from nine variables: total thickness, total thicknesses of sandstone, shale and coal, number of sandstone beds, shale beds and coal beds, sand/shale ratio and ratio of (sandstone + shale)/coal.

Results suggest that Karharbari Formation of Giridih Gondwana sub-basin characterise basic pairs significant at 5% level as total thickness- total thickness of sandstone, total thickness- number of sandstone beds, total thickness of coal beds- number of coal beds, and total thickness of coal beds- number of shale beds. Whereas, the succeeding Barakar Formation characterise significantly correlated lithologic variables such as total thickness-total thickness of sandstone, total thickness- number of sandstone beds, and total thickness of shale beds-number of coal beds. These basic pairs therefore represent interspecific associations among stratigraphic and lithological variables for the Karharbari and Barakar formations, respectively.

The above interspecific association basic pairs of the Karharbari Formation suggest that total thickness of sandstone, number of sandstone beds and numbers of shale beds are largely responsible for variation in net subsidence *i.e.* total thickness and imply the formation of peat swamps in distal flood plains. In the succeeding Barakar Formation the total thickness of sandstone, number of sandstone beds and number of coal beds mainly control net subsidence and the coal swamps developed largely in abandoned channels.

**Keywords:** Interspecific Association, Karharbari and Barakar Formations, Early Permian, Giridih and Korba sub-basins, Gondwana Sequences