Palynological dating of a subsurface coal bearing horizon in East Bokaro Coalfield, Damodar Basin, Jharkhand, India

by

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With 2 plates, 4 text-figures and 3 tables

Abstract

The first stratigraphic borehole EBM-1 in the Muditoli block in the eastern part of the East Bokaro Coalfield, Damodar Basin, is worked out for its spore-pollen content. Gondwana sediments, approximately 1185.00 m thick, comprising green shales, carbonaceous shales, sandstones and coal seams have shown many levels of changing patterns in the spore-pollen groups in the Barren Measures and Barakar formations. Between 1198.30–1095.25 m the specimens are very dark brown and show a distorted exinal surface. The presence of radial monosaccate pollen taxa proves that this stratum is referable to the Talchir Formation, Early Permian. In the up-section, an abundance of Faunipollenites, Scheuringipollenites, Densipollenites and Striatopodocarpites is observed. The relative abundance of these taxa delimits varied levels in the palynosequence of the studied strata from 1086.95 to 13.00 m. Hence, it is inferred that these deposits contain representative palynoassemblages of Early to Late Permian age. The FAD's of Lundbladispora microconata, P. layfordiaspora cancellosa and Arcuatipollenites pellucidus observed at 13.00, 51.50, and 66.70 m depth enhance the end of the Permian level, as these elements are the key species to mark the transition from the Permian into the Lower Triassic. Non-productive strata at varied depths in this complete succession contain an abundance of woody shreds, vegetal matter, and less of palynomorphs, maybe due to the depositional set-up within the sediments during Permian time.

Key words: Palynosequence, Permian, deposition, Damodar Basin.

1. Introduction

The Damodar Basin, situated in the territory of West Bengal and Jharkhand, is the most important deposit of Indian coal. Among the coalfields of this basin – Raniganj, Jharia, East Bokaro, West Bokaro, Ramgarh, South and North Karanpura – the East Bokaro Coalfield is one of the most important. It is placed third amongst the Indian coalfields because of its coal potentiality and the number of its thick coal seams. The name “Bokaro Coalfield” was given by WILLIAMS (1846–1847), due to the Bokaro River flowing in the field. The Bokaro Coalfield is an elongated strip of Gondwana sediments. Its part east of longitude 85° 42’ is commonly known as East Bokaro Coalfield which has an area of about 237 km² between latitude 23° 44’ – 23° 49’ N and longitude 85° 42’ – 86° 84’ E in the Damodar Basin.

Borehole EBM-1 is drilled in the Muditoli Block in the eastern part of East Bokaro Coalfield, Damodar Basin, West Bengal (Text-fig. 1). The spore-pollen assemblages recovered from different lithofacies in borehole EBM-1 are described in this paper.