

# Palynodating of Sub-surface Late Permian Sediments in Bore-hole RPA-2, Palashban Sector, Raniganj Coalfield, West Bengal, India

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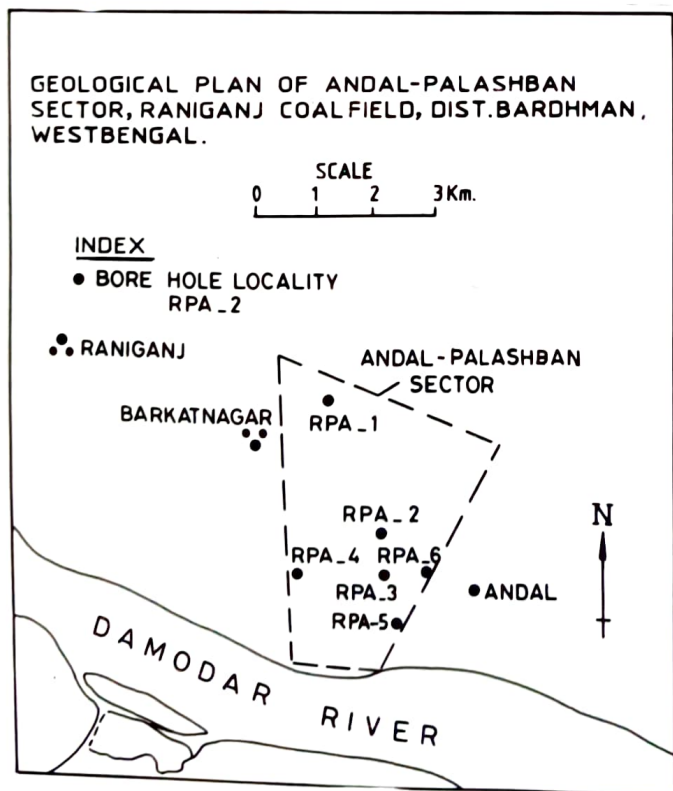
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Meena, K.L. 2000. Palynodating of sub-surface Late Permian sediments in Bore-hole RPA-2, Palashban Sector, Raniganj Coalfield, West Bengal, India. *Geophytology* 28(1&2): 145-148.

THE coal-bearing Upper Damuda Group (Raniganj Formation) in the Raniganj Coalfield encompasses mainly massive, cross bedded to laminated, fine to medium-grained sandstones, interbedded micaceous siltstone, shales and coal seams. The age of Raniganj Formation is generally regarded as Late Permian.

The Raniganj Formation in the Raniganj Coalfield (Type area) is said to be conformably overlying the Iron Stone Shale (early Late Permian) and also conformably overlain by Panchet (Early Triassic) Formation. The Panchet Formation in turn is unconformably

overlain by Mahadeva Formation (Supra/Panchet) which ranges in age from late Early to Late Triassic



Map 1

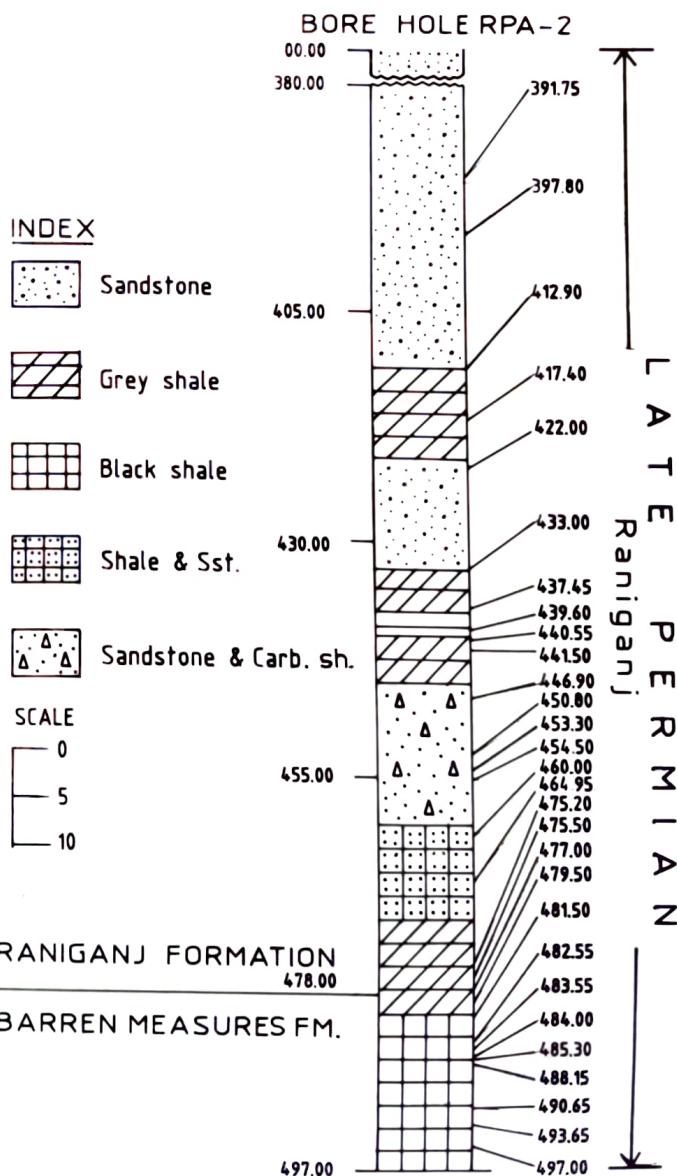


Fig. 1

or even Early Jurassic.

The whole of Gondwana succession in Palashban Sector is covered under alluvium. In this area, the Raniganj Formation has an overlapping contact with the underlying Ironstone Shale (Barren Measures) Formation and also the Raniganj/Panchet boundary is paraconformable representing a hiatus (Fox 1934, Dutta *et al.* 1977).

So far, attempts to date the subsurface Gondwana rocks in eastern region of East Raniganj Coalfield, extending from Ondal to Durgapur area, by palynological methods have ascertained the presence of Raniganj (Late Permian), Panchet (Early Triassic) and Supra-Panchet (Mahadeva) Formations and also the Jurassic sediments (Srivastava & Pawade 1962; Kar 1970a,b; Sarbadhikari 1972; Tiwari 1977; Das & Chandra 1972).

**Table 1- List of samples investigated in Bore-hole RPA-2, Palashban Sector, Raniganj Coalfield, W.B.**

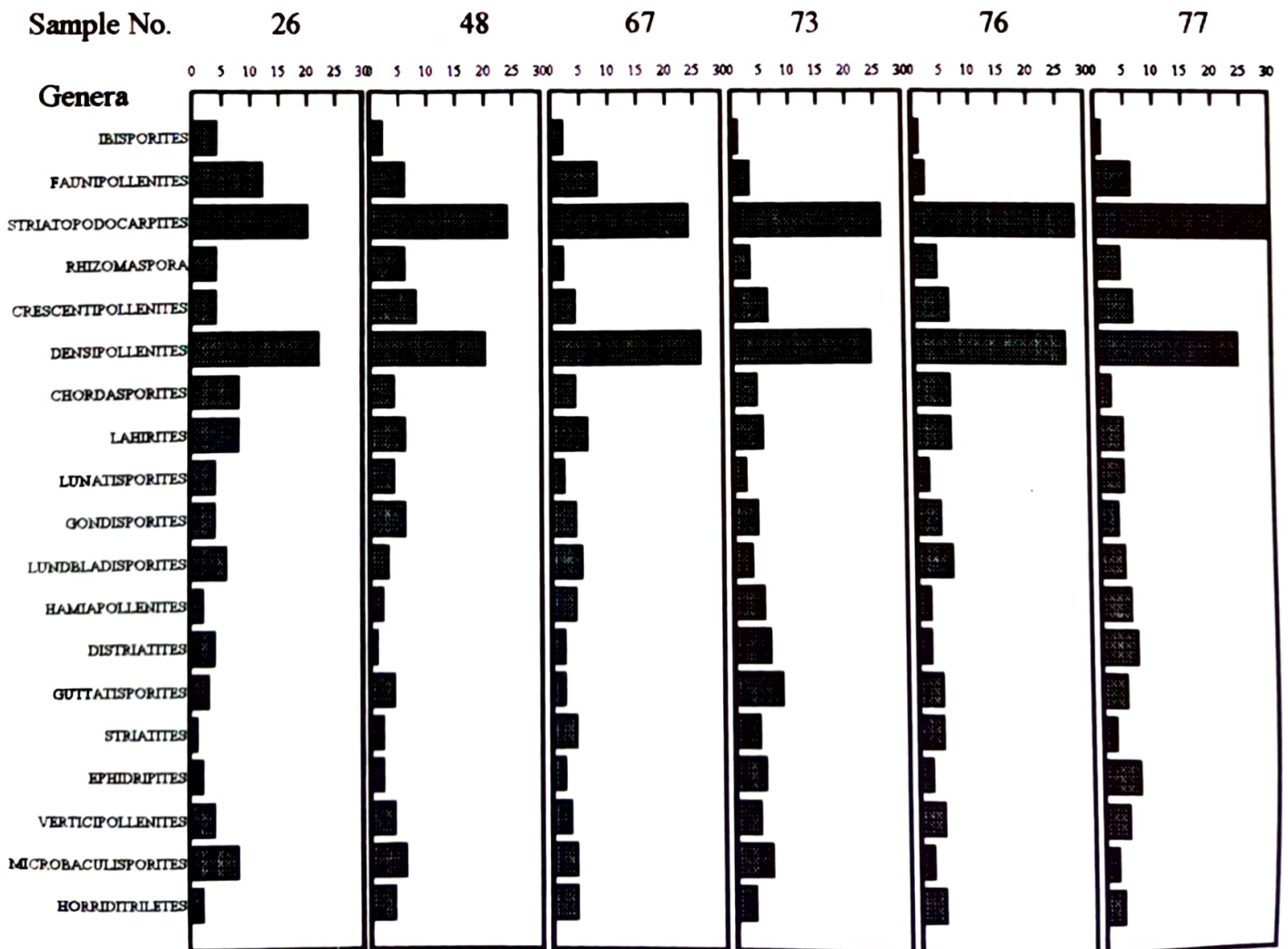
Sl. No.	Depth in metres	Lithology	Remarks
1.	384.75	Sandstone	-
2.	391.75	Sandstone	+
3.	397.80	Sandstone	+
4.	-	Silt, sandstone	+
5.	412.90	Shale	+
6.	417.40	Shale, silt	-
7.	417.90	Sandstone	+
8.	422.00	Sandstone with Laminated siltstone	-
9.	433.00	Sandstone	+
10.	436.70	Grey shale	-
11.	437.45	Sandstone	+
12.	438.50	Sandstone	+
13.	439.60	Grey shale silt-sandstone band	+
14.	440.55	Shale	+
15.	441.50	Shale	+
16.	442.25	Shale	-
17.	443.50	Shale	+
18.	444.60	Sandstone, Shale	-
19.	446.00	Sandstone, Carb. shale	+
20.	446.90	Sandstone, Carb. shale	++
21.	448.50	Sandstone, Carb. shale	-
22.	449.70	Sandstone, Carb. shale	-
23.	450.80	Sandstone, Carb. shale	+
24.	451.00	Sandstone, Carb. shale	-
25.	453.30	Sandstone, Carb. shale	+
26.	454.50	Sandstone, Carb. shale	+++
27.	455.00	Sandstone, Carb. shale	+
28.	455.75	Sandstone, Carb. shale	+
29.	457.30	Sandstone, Carb. shale	+
30.	460.00	Sandstone, Carb. shale	-
31.	460.50	Siltstone, Shale	-
32.	461.25	Siltstone, Shale	-
33.	462.50	Shale	+
34.	462.90	Shale	+
35.	464.95	Ironstone	++
37.	496.00	Laminated sandstone	-
38.	469.75	Black sandstone	-
39.	471.00	Sandstone and Shale	-
40.	472.00	Sandstone and Shale	-
41.	473.35	Shale with plant fossil	+
42.	474.10	Shale with plant fossil	++
43.	474.40	Shale	+
44.	475.20	Shale	+
45.	475.20	Shale	+
46.	477.00	Shale, Raniganj R/B Boundary	+
47.	478.50	Shale, B.M.	+
48.	478.40	Carb. shale	+++
49.	479.00	Carb. shale	+
50.	480.00	Black dense shale	-
51.	480.50	Black dense shale	-
52.	481.00	Black dense shale	-
53.	481.50	Black dense shale	-
54.	482.00	Black dense shale	-
54.	482.00	Black dense shale	-
55.	482.50	Black dense shale	-
56.	483.00	Black dense shale	-

57.	483.55	Black dense shale	+	72.	493.15	Black dense shale	-
58.	484.00	Black dense shale	-	73.	493.65	Black dense shale	+++
59.	484.55	Black dense shale	-	74.	494.14	Black dense shale	-
60.	485.30	Black dense shale	-	75.	495.15	Black dense shale	-
61.	486.30	Black dense shale	-	76.	496.50	Black dense shale	+++
62.	487.15	Black dense shale	-	77.	497.00	Black dense shale	+++
63.	487.45	Black dense shale	-				
64.	488.15	Black dense shale	-	+ Spore rare    + Spore common			
65.	488.40.	Black dense shale	-	+++ Spore rich    - No spore			
66.	490.13	Black dense shale	-				
67.	490.65	Black dense shale	+++				
68.	491.15	Black dense shale	-				
69.	491.65	Black dense shale	-				
70.	492.40	Black dense shale	-				
71.	492.90	Black dense shale	-				

### Palynological assemblage

In present palynological processing of total 77 samples (Map 1) only 37 samples yielded palynomorphs (Table 1, Histogram-1). Out of these six samples having rich spores have been utilised for quantitative analysis.

A perusal of Histogram-1 reveals the promi-



Histogram 1

nence of the genus *Striatopodocarpites* and *Densipollenites* along with significant association of *Gondisporites raniganjensis*, *Cyclobaculisporites gondwanensis*, *Didecitriletes horridus*, *Densipollenites magnicarpus*, *Tiwariasporis*, *Osmundacidites senectus* in low percentages indicate Late Permian affinity. The scanty presence of *Lundbladisporea brevicula*, *Arcuatipollenites pellucidus* suggests the younger affinity for the present assemblage. The bore hole runs through Raniganj/Barren Measures formations lithologically while palynologically it is comparable to the RIA of Tiwari and Singh (1986).

The palynological investigation carried out here shows continuation of Raniganj palynoflora into lithologically differentiated Barren Measures sediments (Fig. 1) in Bore-hole RPA-2.

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(Received 19.01.1998; Accepted 12.10.1999)