

Palynological dating of sub-surface Kamthi sediments in Ib-River Coalfield, Orissa

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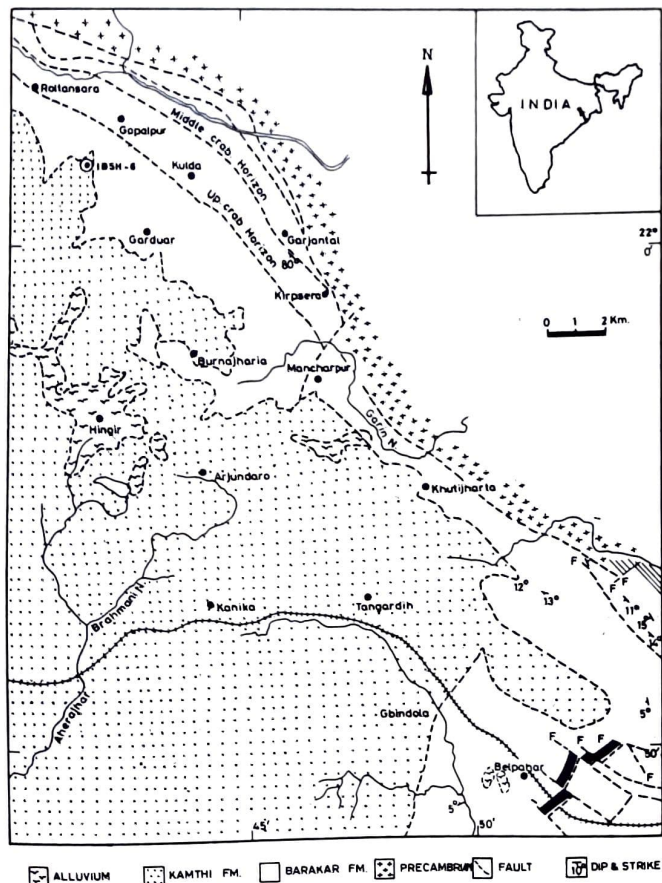
Meena K.L. 1998. Palynological dating of sub-surface Kamthi sediments in Ib-River Coalfield, Orissa. *Geophytology* 27(1&2): 107-110.

THE general geological succession in Ib-River Coalfield, Son-Mahanadi Basin, India exhibits the presence of Barakar Formation overlain by the Kamthi Formation (Raja Rao, 1982). In this sequence the presence of Barren Measures and Raniganj Formations are not demarcated. The Kamthi overlies the Barakar Formation, hence the dating and correlation of the former is necessary in this basin. With this objective one bore core (bore-

hole IBSH-6) was investigated from Belapahar area (Map-1) near Gopalpur village, 2 Km north of Deoghara railway station in district Sambhalpur, Orissa.

The palynological report from the Belapahar area is almost non-existent except for a brief report (Maiti 1994) and this is the first record from this area relating to palynological succession and the age of the Kamthi Formation.

The geological succession in general in the Ib-River Coalfield is enumerated below (after Raja Rao 1982):



Map 1. Location map of Bore hole IBSH-6 (after G.C. Chatterji 1947).

Age	Group	Formation, Lithology and thickness
Recent		Alluvium, Laterite/Recent gravel and conglomerate beds.
Upper Permian to Lower Triassic	Lower Gondwana	<i>Kamthi</i> : Conglomerates, ferruginous sandstone and red shale (300 m). <i>Barakar</i> : Felspathic sandstones with conglomerate bands and lenses: White grey and carbonaceous shales, fire clay and coal seams (600 m). <i>Karbarbari</i> : Mostly coarse grained sandstones with one thin coal seam (90-125 m). <i>Talchir</i> : Diamicite, greenish sandstones, olive and chocolate coloured needle shales and rythmites (130 m).
	Unconformity.....
Precambrian		Granite gneisses, amphibolites, migmatites, etc.

The Belapahar area is generally covered by Kamthi Formation. Below the red ferruginous sand-

stone of the Kamthi Formation lies the Barakar Formation which is the main coal-bearing horizon in this area.

The thickness of Kamthi Formation in bore hole IBSH-6 is about 234.50 m which is lithologically characterised by conglomerates, ferruginous sandstone, red shales, grey-shale, siltstone and thin coal bands (Fig. 1, Table 1). The details regarding collected samples are shown in Table 1.

Table 1: Sample details of bore hole IBSH-6 from Belapahar area, Ib-River Coalfield.

Sl. No.	Depth in m from surface	Lithology	Remarks
1.	206.00	Red Shale	-
2.	206.50	Siltstone	++
3.	207.50	Sandy Shale	+++
4.	207.75	Grey Shale	+++
5.	208.00	Coal	-

6.	209.25	Grey Shale	-
7.	210.25	Grey Shale	-
8.	211.00	Siltstone	-
9.	212.00	Siltstone	-
10.	212.60	Siltstone	+++
11.	213.60	Siltstone	+++
12.	214.50	Siltstone	-
13.	215.25	Siltstone	-
14.	215.80	Siltstone	-
15.	217.00	Siltstone	-
16.	217.50	Grey Shale	-
17.	218.75	Grey Shale	-
18.	220.00	Siltstone	+
19.	221.00	Grey Shale	+++
20.	221.40	Coal	+
21.	222.40	Grey Shale	-
22.	222.90	Grey Shale	-
23.	224.10	Grey Shale	-
24.	224.75	Coal	+
25.	225.75	Siltstone	+
26.	227.40	Carb. Shale	+++
27.	228.30	Grey Shale	+
28.	231.50	Siltstone	++
29.	231.70	Siltstone & Coal band	++
30.	232.70	Siltstone	-
31.	233.20	Laminated Shale	+
32.	234.50	Grey Shale	-
33.	237.50	Intercalated Clay	-
34.	238.05	Siltstone	-
35.	239.05	Carb. Shale intercalation	-
36.	240.05	Grey Shale	+
37.	241.00	Grey Shale	-
38.	242.50	Grey Shale	-
39.	243.50	Coal	-
40.	244.00	Grey Shale	+++
41.	245.00	Grey Shale	-
42.	247.00	Siltstone	-
43.	248.00	Carb. Shale	+
44.	248.85	Grey Shale	+

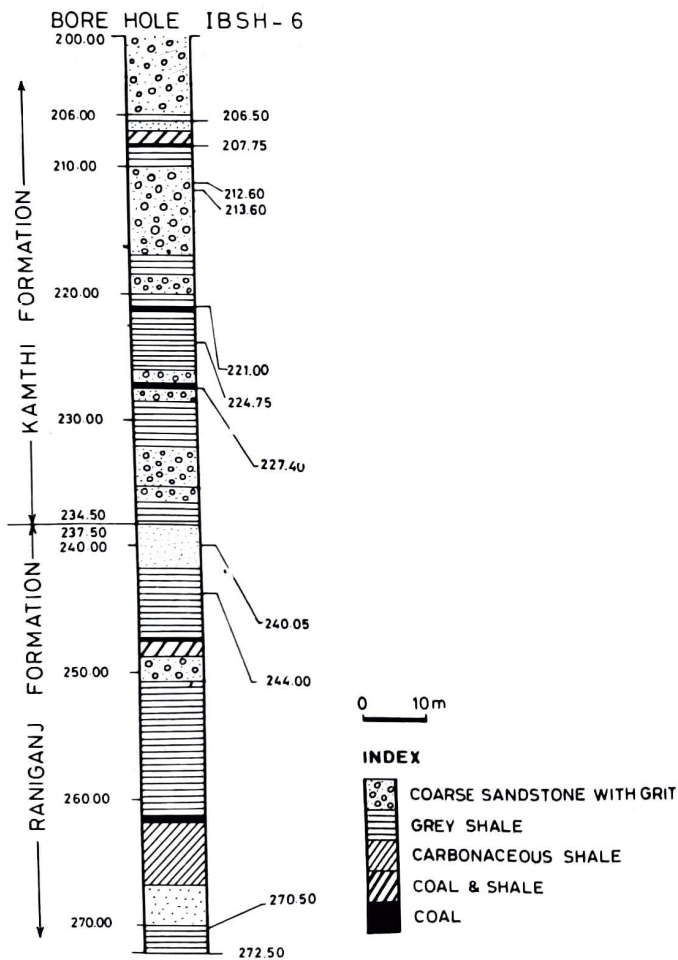


Fig. 1. Litholog of Bore hole IBSH-6.

45.	256.50	Coal	-
46.	257.50	Grey Shale	-
47.	259.50	Carb. Shale	+
48.	260.50	Grey Shale	-
49.	261.50	Grey Shale	-
50.	262.00	Clay	-
51.	263.00	Laminated Shale	-
52.	265.00	Carb. Shale	-
53.	269.50	Siltstone	+
54.	270.50	Grey Shale	+
55.	270.80	Grey Shale	-
56.	272.50	Grey Shale	-

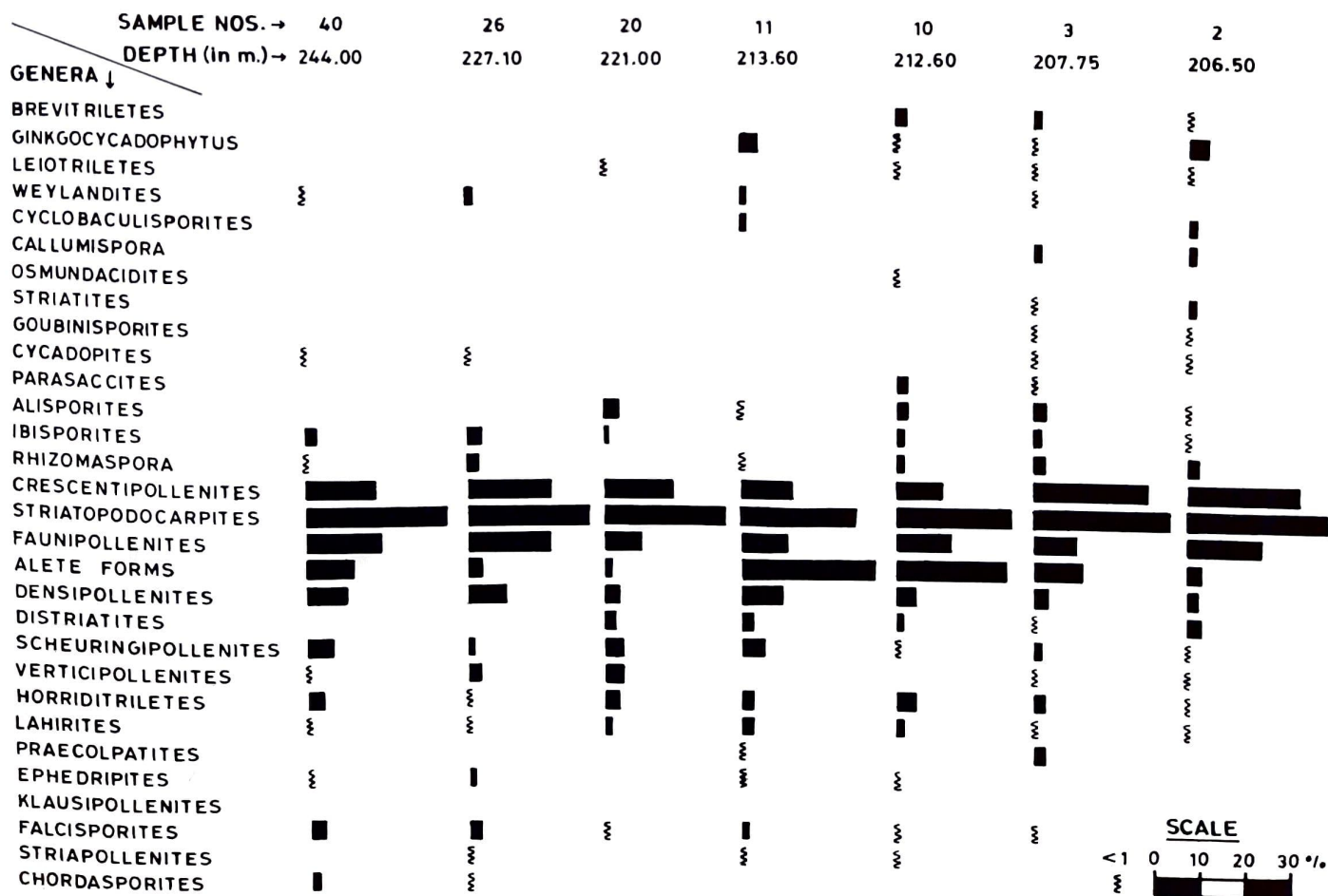
+ - Spore Rare; +++ Rich spore; ++ Spore common; - No spore

Palynological Assemblage

In bore hole IBSH-619 samples yielded the palynomorphs (Histogram-1). The quantitative

composition of the assemblage has been determined after counting 200 specimens from each sample.

A perusal of Histogram-1 reveals the prominence of the genus *Striatopodocarpites* and *Crescentipollenites* with significant association of *Faunipollenites*, Alete forms, etc between 206.50-244.0 m. The appearance of *Lunatisporites*, *Goubinispora*, *Falcisporites*, *Chordasporites*, *Satsangisaccites*, in low percentages indicate younger affinities. The genus *Crescentipollenites* attains subdominance during Late Permian after the decline of *Densipollenites magnicarpus* palynozone in other basins and is comparable to the assemblage R-IA of Tiwari and Singh (1986). The upper miofloral assemblage zone demarcated by Maiti (1994) from Sundergarh District, Orissa (bore hole IBH-16) is similar to the assemblage identified here indicating Late Permian.



Histogram 1. Percentage frequency of important miospore genera through Bore hole IBSH-6.

In the present bore hole (IBSH-6) the gradual decline of *Densipollenites* and consequent rise in the percentage of *Crescentipollenites* is very characteristic. The presence of Raniganj flora from 272.80 m continued into lithologically differentiated Kamthi sediments (upto 234.50 m) in bore hole IBSH-6.

Palynological analyses suggest the presence of definite Late Permian sediments from 272.80 m to 206.50 m in bore-hole IBSH-6, Belpahar area Ib River Coalfield. The thick red ferruginous coarse-grained sandstone strata lying above 206.50 m have not yielded palynofossils but may represent the Early Triassic (Kamthi) sediments in view of the change in lithology overlying the youngest Late Permian sediments.

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