

A JURASSIC MIOSPORE ASSEMBLAGE FROM A BORE - HOLE IN SURENDRANAGAR DISTRICT, GUJARAT

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ABSTRACT

A palynological assemblage recovered from a sample in bore core drilled near Pipli, Gujarat, contains 16 genera and 18 species of miospores. Trilete genera are rich in quality as well as quantity. The most dominating form is *Dictyophyllidites mortoni* (de Jersey) Playford & Dettmann which is followed by *Araucariacites australis* Cookson, *Cyathidites minor* Couper, and *Guttatisporites vischeri* de Jersey. The quantitative composition of the assemblage is unique and on the basis of available data it dated to be of early Middle Jurassic age.

INTRODUCTION

Pipli is a small place in Surendranagar District, a part of former princely state of Saurashtra (Kathiawar) which lies physiographically just below "Kachchh peninsula" and is separated from the latter by the "Gulf of Kachchh" and the "Little Rann of Kachchh". Geology and Palaeobotany of the Saurashtra (Kathiawar) region are not so well known. FEDDEN (1884) dealt in detail with the geology of this area. According to him the oldest exposed strata here are "Umia beds" which contain plant fossils of Jurassic age. The "Umia beds" are successively overlain by "Wadhwan Sandstone", "Trappean grits", "Traps", "Lateritic rocks", "Gaj beds", "Dwarka beds" and "Alluvium". The plant-bearing "Umia beds" were also known as the "Kathiawar beds" (OLDHAM, 1894) or the "Than plant beds" (PASCOE, 1959). SRIVASTAVA AND RIZVI (*in* SASTRI *et al.*, 1977, p. 34) redefined the "Umia" sediments around Dhrangadhra in Surendranagar District and named these as Dhrangadhra Formation.

Plant microfossils from the Dhrangadhra Formation are very meagrely known. VARMA AND RAWAT (1964) described a number of palynomorphs which were re-investigated by VENKATACHALA AND RAWAT (1970). KUMARAN *et al.* (1984) also described a rather poorly preserved palynological assemblage from Tarnetar, Surendranagar District.

In the present paper, a well preserved palynological assemblage recovered from a bore-hole drilled near Pipli ($71^{\circ} 42' 54''$: $23^{\circ} 04' 18''$; Map 1; Fig. 1) in Dasada Taluka of Surendranagar District has been analysed. The samples were sent by Mr. R. C. Kachhara, the then Officer-in-charge of "Kachchh Coal Scheme" for age determination. Out of six samples only one carbonaceous shale sample (depth 211-211.55 m) yielded satisfactory palynofossils.

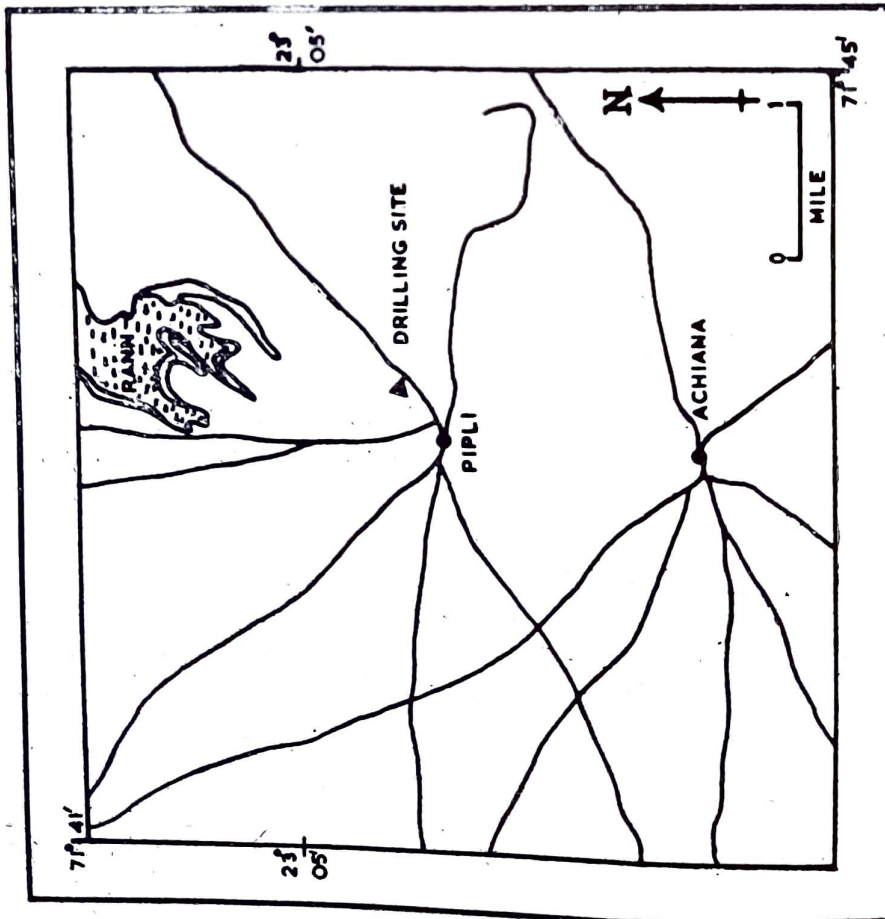
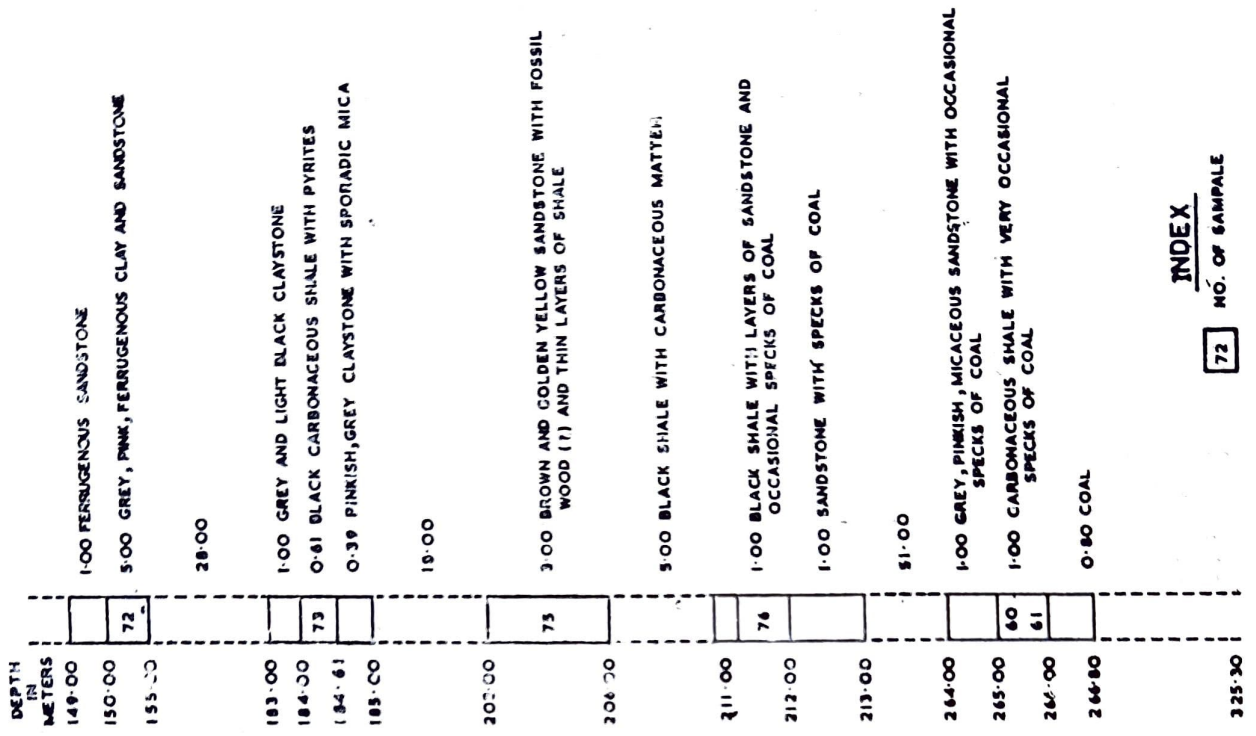
MIOSPORE ASSEMBLAGE

A check-list of the miospores recovered from sample No. 76 is given below. Some of the important taxa are illustrated in plate 1.

Cyathidites minor Couper, 1935

Biretisporites potonieii Delcourt & Sprumont, 1955

LITHOLOG OF THE BORE - HOLE NEAR PIPLI,
 (23° 04' 18" : 71° 42' 54") GUJARAT
 (With Reference To The Samples)



Map I

INDEX

72 NO. OF SAMPLE

Fig. - 1

Todisporites major Couper, 1953
Dictyophyllidites mortoni (de Jersey) Playford & Dettmann, 1965
Concavissimisporites verrucosus Delcourt & Sprumont, 1955
Guttatisporites vischeri de Jersey, 1968
Foveotriletes sp.
Lycopodiumsporites sp.
Matonisporites indicus Kumar, 1973
Matonisporites sp.
Ischyosporites crateris Balme, 1957
Laevigatosporites ovatus Wilson & Webster, 1946
Callialasporites dampieri (Balme) Sukh Dev, 1961
Callialasporites segmentatus (Balme) Srivastava, 1966
Alisporites sp.
Podocarpidites sp.
Araucariacites australis Cookson, 1947
Laricoidites indicus Singh, Srivastava & Roy, 1964

The assemblage is qualitatively rich in trilete miospore genera. The quantitative estimation of this assemblage has also shown that the trilete spores dominate over alete and saccate pollen grains. The percentages of different species in this assemblage are as follows :

Cyathidites minor—12%, *Biretisporites potoniaei*—1.5%, *Todisporites major*—2.5%, *Dictyophyllidites mortoni*—35.5%, *Concavissimisporites verrucosus*—2%, *Guttatisporites vischeri*—10%, *Foveotriletes* sp.—0.5%, *Lycopodiumsporites* sp.—1%, *Matonisporites* sp.—3%, *Ischyosporites crateris*—3%, *Callialasporites dampieri*—3.5%, *C. segmentatus*—1.5%, *Alisporites* sp.—1%, and *Araucariacites australis*—23%.

The dominant element is *Dictyophyllidites mortoni* contributing 35.5 per cent to the total assemblage which is followed by *Araucariacites australis* (23%), *Cyathidites minor* (12%) and *Guttatisporites vischeri* (10%). The trilete genera as a whole contribute 71 per cent to the total assemblage followed by alete grains (23%). Monosaccate and bisaccate pollen contribute 5 per cent and 1 per cent respectively. Monolete grains were not found in counting.

The sub-surface palynological assemblages described by KOSHAL (1975) from Banni, Kachchh, range in age from Rhaetic Liassic to early Cretaceous. The present assemblage does not resemble any of the four palynozones, viz., *Lunatisporites* (*Taeniaesporites*) zone, *Gliscopollis*—*Classopollis* zone, *Callialasporites trilobatus* zone and *Inaperturopollenites*—*Araucariacites* complex zone.

In overall composition the present assemblage, with the presence of *Cyathidites minor*, *Biretisporites potoniaei*, *Concavissimisporites verrucosus*, *Ischyosporites crateris*, *Callialasporites dampieri*, *C. segmentatus*, *Araucariacites australis*, *Laricoidites indicus*, resembles the known Jurassic-Cretaceous assemblages, but differs from the known ones in having trilete species as dominating elements.

Dictyophyllidites mortoni (de Jersey) Playford & Dettmann, reported from Rhaetic of Australia, is also known from the Jurassic. *Guttatisporites vischeri*, which forms 10 per cent of the total assemblage, is also an Australian species known from Middle Triassic strata. On the other hand, certain characteristic Cretaceous taxa, such as—*Impardecispora*, *Cicatricosisporites*, *Aequitriradites*, *Cooksonites*, etc. have not been found in the Pipli assemblage. Thus, on the basis of present available data it would seem that



this mioflora has early Middle Jurassic affinities. However this conclusion does not tally with the age depicted by surface megafloral assemblage to which an early Cretaceous age has been assigned (JANA & BOSE, 1981).

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EXPLANATION OF PLATE 1

All figures $\times 500$

(Co-ordinates given here are of Carl Zeiss Jenna microscope no. 622761)

1. *Cyatheidites minor* Couper, Sl. no. 6756: 20×135.8 ; 2. *Todisporites major* Couper, Sl. no. 6754: 18×134.5 ; 3-5. *Dictyophyllidites mortoni* (de Jersey) Playford & Dettmann, Sl. nos. 6756: 10×108 ; 6755: 10×118 ; 6757: 10.5×135 ; 7. *Matonisporites indicus* Kumar, Sl. no. 6755: 18.5×129 ; 8. *Biretsporites potoniaei* Delcourt & Sprumont, Sl. no. 6754: 24×136.5 ; 9. *Matonsportites* sp., Sl. no. 6752: 12×127 ; 10. *Foveotriletes* sp., Sl. no. 6757: 10.2×128.2 ; 11. *Ischyosporites carteris* Balme, Sl. no. 6752: 8.5×132 ; 12-13. *Guttatsporites vischeri* de Jersey; Sl. nos. 6756: 18×125 ; 6757: 12×123 ; 14. *Concavissimisporites verrucosus* Delcourt & Sprumont, Sl. no. 6756: 9×104 ; 15. *Laevigatosporites ovatus* Wilson & Webster, Sl. no. 6754: 10×125 ; 16. *Laricoidites indicus* Singh, Srivastava & Roy, Sl. no. 6754: 12×113.5 ; 17. *Densoisporites* sp., Sl. no. 6754: 10×103.5 ; 18. *Araucariacites australis* Cookson, Sl. no. 6752: 15.8×115 ; 19. *Araucariacites australis* (split. specimen), Sl. no. 6754: 11×115 .