

ARASPORITES GEN. NOV.—A NEW ACAVATE TRILETE SPORE FROM LOWER GONDWANA OF INDIA

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ABSTRACT

A new miospore genus *Arasporites* gen. nov. has been described from the Barakar Formation (Lower Permian) of the Lower Gondwana Sequence of West Bokaro Coalfield, Bihar, India. It is a thick, circular trilete with spines present on both the surfaces of the miospore. Its occurrence is restricted to the seam XI of Ara Block, West Bokaro Coalfield.

INTRODUCTION

A number of trilete miospores have been described from the Lower Gondwana Sequence of India. BHARADWAJ (1962) described some trilete genera from the Raniganj Formation of Raniganj Coalfield. BHARADWAJ AND SALUJHA (1964) further added a triangular trilete genus as *Horriditriletes* from the same area. TIWARI (1964) described some zonate and cingulate triletes from Korba Coalfield. Subsequently, VENKATACHALA AND KAR (1965) also described two triletes, *Didecitriletes* and *Lacinitriletes*, from North Karanpura Coalfield which have restricted distal ornamentation. BHARADWAJ AND SRIVASTAVA (1969) described three trilete miospores viz., *Callumispora*, *Brevitriletes* and *Pseudoreticulatispora* occurring in Chirimiri, Sohagpur, Bistrampur and Talchir Coalfields. TIWARI AND MOIZ, (1971) described *Godavarisporites* and *Lobatisporites* from Godavari Valley coalfields. BHARADWAJ AND DWIVEDI (1977) described a cavate trilete, *Insignisporites*, from the Barakar Formation of South Karanpura Coalfield. TIWARI AND SINGH (1981) have instituted another, varitrilete genus, *Imparitriletes*, from Korba Coalfield. However, the study of the spora dispersae of the Lower Gondwana sediments in West Bokaro Coalfield, Bihar, India has revealed a new association of morphographic characters which has been described in the present paper under the genus *Arasporites* gen. nov. Morphographic characters have been studied in detail under transmitted light, differential interference contrast (DIC) and also scanning electron microscopy (SEM).

Genus **Arasporites** gen. nov.

Type Species—*Arasporites crassus* sp. nov.

Generic Diagnosis—Miospores circular to subcircular. acavate; triletes distinct, raised. Exine thick, ornamented with spines on both the surfaces.

Generic Description—Miospores circular in shape, but may assume subcircular shape due to folding or flattening. Trilete mark distinct, rays straight, tapering, equal to each other and placed at equal angles (Pl. 1, Fig. 2), labra thin and vertex slightly raised. Exine fairly thick as is usually distinct along the equatorial margin in normally flattened specimens (Pl. 1, Fig. 1). Exine ornamented with long spines, protruding out of the equatorial margin (Pl. 1, Figs. 1, 3). Spines present on both

the surfaces of the miospore. Ornamentation considerably reduced on proximal surface (Pl. 1, Fig. 2).

Comparison—The genus *Arasporites* gen. nov. compares with the radial, baculate genus *Cyclobaculisporites* Bhardwaj (1955) in overall shape but differs in having spines as its ornamentation. *Verrucosisporites* Ibr. emend. Smith & Butterworth (1967) has a circular shape but bears verrucae on the exine. Similarly *Cyclogranisporites* Pot. & Kr. (1954) is ornamented with grana and thus differs from the new taxon proposed here. *Raistrickia* (Schopf, Wilson & Bentall) Pot. & Kr. (1954) is a roundly triangular trilete and bears stout baculae over the exine. *Phidiaesporites* Foster (1979) is a circular, trilete miospore having differentially thickened exine set with apiculate elements and thus has a superficial resemblance. In *Bipartitisporites* Segroves (1970) the exine is thick, intrapunctate and is irregularly intragranulose and intrabaculate. *Osmundacidites* Couper (1953) compares in its radial symmetry but differs in being sculptured by conical baculae and irregular grana. Among other trilete miospores, *Acanthotriletes* (Naum.) Pot. & Kr. (1954) resembles in having spinose ornamentation but differs in being triangular in shape. Thus, the genus *Arasporites* gen. nov. is distinctly different from the known taxa of the Lower Gondwana and is represented by a significant population in the sporae dispersae of West Bokaro Coalfield. A number of specimens have been studied with respect to their overall size, exine thickness and the nature of ornamentation.

***Arasporites crassus* sp. nov.**

Pl. 1, Figs 1-8

Holotype—Pl. 1, Fig. 2; Size 86 μm ; Slide No. S 87/R; BSIP Museum Reg. No. 8505.

Locus typicus—XIth Seam, Ara Block, West Bokaro Coalfield, Bihar, India.

Stratum typicum—Barakar Formation, Permian, Lower Gondwana, India.

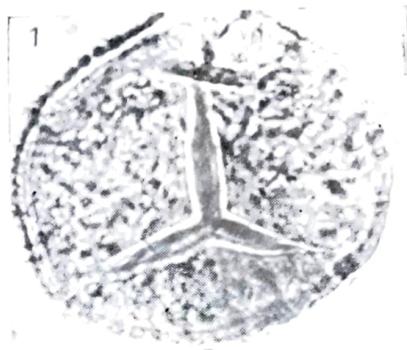
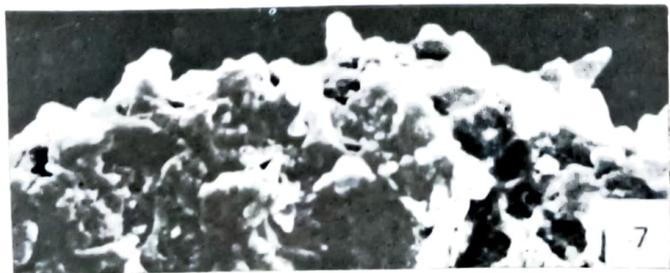
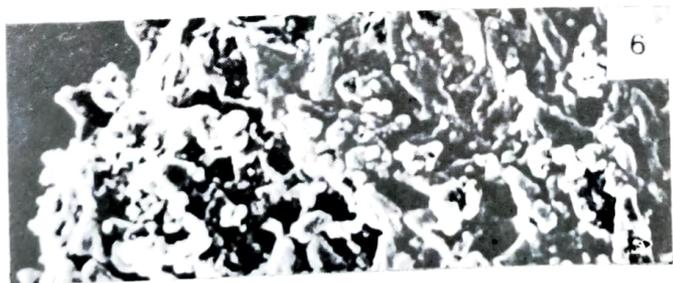
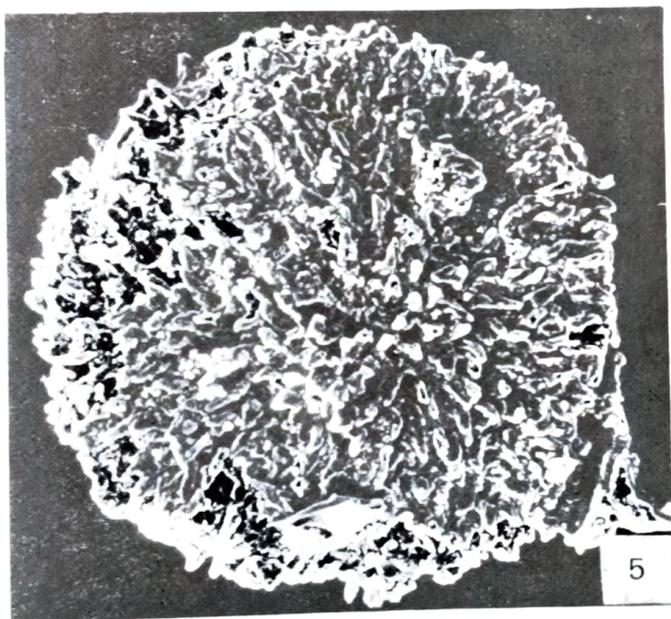
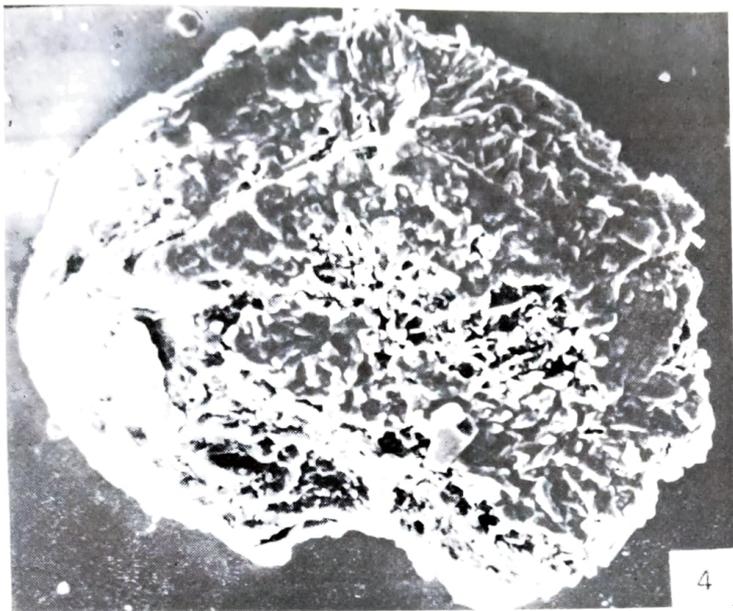
Specific Diagnosis—Miospores circular to subcircular, size 86 μm . Trilete mark present, rays tapering, reaching upto $2/3$ area of the spore. Exine 2-6 μm thick. Spines 1-5 μm long and 1-2 μm wide at base.

Specific Description—Miospores circular to subcircular in shape, golden dark brown in colour, size range 60-86 μm . Trilete mark distinct, rays broad at apex and taper to a pointed end reaching upto $2/3$ area of the miospore radius, ray length 41.05 μm . Exine 2-6 μm thick as distinct along the equatorial margin. Spines 1-5 μm long and 1-2 μm wide at base, sharply pointed to round tipped (Pl. 1, Figs. 2, 6-8). Spines thin, delicate and semitransparent. Distally spines close, 1-3 μm , bases separated from the adjacent ones. Spines considerably reduced in contact area on the proximal surface.

This species occurs (upto 2%) in XI seam of Ara Block, West Bokaro Coalfield while it is absent in the overlying and underlying coal seams. This taxon may be utilised as marker of similar horizons lying at the same time level in adjacent areas of the coalfield.

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EXPLANATION OF PLATE 1

Figs 1 to 8-*Arasporites crassus* gen. et sp. nov.

1. Proximal view showing trilete and exine thickness, $\times 500$ (Transmitted light).
2. Proximal view showing reduced ornamentation in the contact area, $\times 750$ (DIC).
3. Proximal view (Holotype), $\times 750$ (DIC).
4. Slightly lateral view. $\times 1200$ (SEM).
5. Distal view, $\times 1000$ (SEM).
6. Exine ornamentation, $\times 2000$ (SEM).
7. Exine ornamentation, $\times 3000$ (SEM).
8. Exine ornamentation, $\times 3600$ (SEM)