PALYNOLOGY OF THE MESOZOIC SEDIMENTS OF KUTCH, W. INDIA—2. *BHUJIASPORITES* GEN. NOV., A NEW TRILETE SPORE GENUS

B. S. VENKATACHALA*, R. K. KAR & S. RAZA
Birbal Sahni Institute of Palaeobotany, Lucknow

ABSTRACT

Gulate spores with a beaked meridional outline and raised trilete mark and prominent distal ornamentation are described under a new generic name *Bhujiasporites*. The spores are recovered from the Bhuj Stage (Lower Cretaceous) of Kutch, India.

INTRODUCTION

PALYNOLOGY of the Lower Cretaceous rocks of Kutch have been studied by Singh, Srivastava and Roy (1964); Venkatachala (1967a, 1967b); and Venkatachala and Kar (1968). The present paper deals with a new spore genus recovered from the Bhuj Stage. The material is grey coloured shales collected from different measured sections of the Bhuj Stage around the town of Bhuj, Kutch. The shales were macerated with commercial Nitric acid (40%) for 2-4 days, was subsequently treated with Hydrofluoric acid (40%) for 3-5 days and finally with Potassium hydroxide solution (5%) for 2-5 minutes. Polyvenyl alcohol and canada balsam were ued for mounting the slides. The unused material and slides are preserved at the repository of the Birbal Sahni Institute of Palaeobotany, Lucknow.

SYSTEMATIC PALYNOLOGY

Genus — *Bhujiasporites* gen. nov.

Type Species — *Bhujiasporites hirsutus* sp. nov.

Diagnosis — Gulate spores, triangular – subtriangular in polar view and ± pitcher-shaped in meridional outline. Trilete, rays well developed, raised, extending almost upto equator. Exine thick, intrapunctate, differentially ornamented, distally variously sculptured with coni, verrucae, bacula and hair-like processes.

Description — Spores triangular – subtriangular in polar view; laterally compressed specimens are cordate to pitcher-shaped with rays projecting from the equator in the form of a beak to form the gula. Size range 60-90 μ. Trilete, rays equal, well developed, raised, extending to almost upto the equatorial margin, apex and vertex high, tecta broad, raised, rays projecting upto 20 μ in meridional view. Commissure well pronounced. Exine upto 10 μ thick, intrapunctate, distally variously ornamented, sculptural elements ranging from coni – verrucae – spines – bacula – hair-like processes. The ornamentation in several specimens coalesce together to appear like a cingulum in equatorially flattened specimens.

Comparison — *Ceratosporites* Cooks. & Dettm. (1958) though possessing differential ornamentational pattern (*see* VENKAT. & KAR, 1965) on surfaces can be differentiated by its lack of gulate trilete apparatus. *Balmeisporites* Cooks. & Dettm. (1958) is the closest to *Bhujiasporites* in morphology, but can be distinguished by its well pronounced surface reticulum and three highly developed, laesurate lips (see DETTM. 1963). *Sestosporites* Dettm. (1963) is characterized by differential thickening of the exine to form crassitudes in the inter-radial regions and foveolate to foveo-reticulate exine. *Ischyosporites* Balme (1957) possesses anastomosing muri on the distal side and exinal thickenings (valvae) in the equatorial regions. *Cyclotriletes* Mad. (1964) is circular–subcircular in shape and has coni for sculptural elements. *Spinotriletes* Mad. (1964) resembles *Bhujiasporites* in shape and differential ornamentational pattern on surfaces. *Spinotriletes* can, however, be readily distinguished by its ill-developed, mostly indistinct trilete mark. *Keuperisporites* Schulz (1965) is mostly circular and possesses big warts as sculptural elements. *Zebrasporites* Kl. (1960) is triangular-subtriangular in shape, trilete, exine is proximally

*Present address — Palynology Laboratory, Research and Training Institute, Oil and Natural Gas Commission, Dehradun.

laevigate but distally it possesses radially raised muri. *Lukugasporites* Kar & Bose (1966) described from the '*Assise des schistes noirs de la Lukuga*' of Congo resembles *Bhujiasporites* in shape and well developed, raised trilete rays but is differentiated by its strongly built spines on distal surface. *Archaeotriletes* Naum. (1953) though possessing a large apical prominence and a heavily spinose periphery is characterized by anchor-shaped appendages for ornamentation (*see* BALME & HASSEL, 1962) and is a dominant component of Devonian rocks. *Bhujiasporites* proposed here is distinguished from all the known trilete genera by its triangular – subtriangular shape, well developed, gulate trilete mark, extending almost upto the equator with pronounced distal ornamentation.

Derivation of Vame — After Bhuj Stage.

Bhujiasporites hirsutus sp. nov.

Pl. 1, Figs. 1-15

Holotype — Pl. 1, Fig. 2. Size 76 μ. Slide no. 3310.

Type Locality — Bhuj exposure near Bhuj, Kutch district, Gujarat. Bhuj Stage (Lower Cretaceous).

Diagnosis — Gulate spores, triangular – subtriangular in polar view. Size range 60-90 μ. Trilete, rays well developed, raised, extending almost upto equator, apex and vertex high, labra broad. Exine upto 10 μ thick, intrapunctate, distally variously ornamented, sculptural elements varying from coni – verrucae – bacula – spines – hair-like processes.

Description — Spores mostly triangular in polar view and ± pitcher-shaped in meridional view with trilete aperture projecting out in the form of a beak. Apices broadly rounded, inter-apical margins mostly straight – markedly convex. Trilete, rays well developed, raised upto 10 μ, ± equal, uniformly broad, extending almost upto equator, apex and vertex high, labra and tecta broad. Commissure distinct. Exine thick, intrapunctate, profusely sculptured on distal surface. Sculptural processes range from coni to hirsute spines which cohere together to appear like a cingulum in equatorially flattened specimens.

REFERENCES

BALME, B. E. (1957). Spores and pollen grains from the Mesozoic of Australia. *Commonw. sci. ind. Res. Org. Aust. Coal. Res. Sect.* **25**: 1-48.

BALME, B. E. & HASSEL, C. W. (1962). Upper Devonian spores from the Canning basin, Western Australia. *Micropaleontology*. **8**: 1-28.

COOKSON, I. C. & DETTMANN, M. E. (1958). Cretaceous 'megaspores' and a closely associated microspore from the Australian region. *Ibid.* **4**: 39-49.

DETTMANN, M. E. (1963). Upper Mesozoic microfloras from South-eastern Australia. *Proc. R. Soc. Vict.* **77** (1): 1-148.

KAR, R. K. & BOSE, M. N. (1966). Palaeozoic *Sporae dispersae* from Congo. 3. *Assise des schistes noirs de la lukuga*. *Annls Mus. r. Afr. cent. Ser.* **8°, 54**: 1-88.

KLAUS, W. (1960). Sporen der karnischen Stufe der ostalpinen Trias. *Jb. Geol.* **5**: 107-183.

MÄDLER, K. (1964). Die geologische Verbreitung von Sporen und Pollen in der Deutschen Trias. *Beih. geol. Jb.* **65**: 1-147.

NAUMOVA, S. N. (1953). Spore-pollen complexes of the Upper Devonian of the Russian Platform and their stratigraphical value. *Trudy Inst. Geol. Akad. Nauk* S. S. S.R. **143** (60): 1-204 (in Russian).

SINGH, H. P., SRIVASTAVA, S. K. & ROY, S. K. (1964). Studies on the Upper Gondwana of Cutch-1. Mio- and macrospores. *Palaeobotanist.* **12** (3): 282-306, 1963.

VENKATACHALA, B. S. (1967). Palynology of the Umia plant beds of Kutch, W. India. 1. Stratigraphic Palynology of the Bhuj exposures near Walkamata, Kutch district, Gujarat State. *Rev. Palaeobot. Palynol.* **5**: 169-177.

Idem (in press). Palynology of the Umia plant beds of Kutch, W. India. 2. Systematic palynology of the Bhuj exposures near Walkamata, Kutch district, Gujarat State. *Palaeobotanist.*

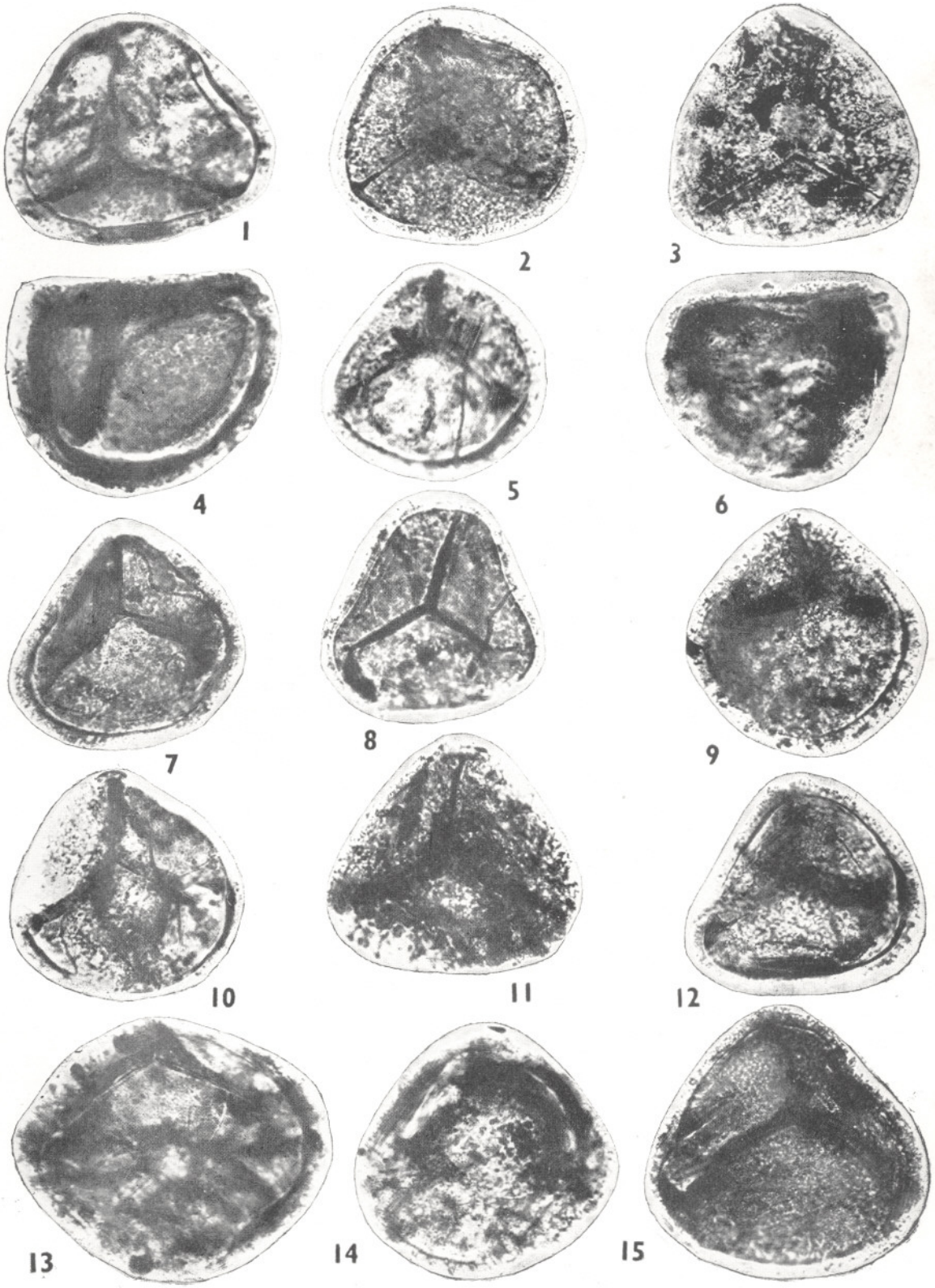
VENKATACHALA, B. S. & KAR, R. K. (in press). Palynology of the Mesozoic sediments of Kutch, W. India. 1. Palynological fossils from the Bhuj exposures near Dayapar, Kutch district, Gujarat State. *Ibid.*

EXPLANATION OF PLATE

(*All photomicrographs are enlarged ca.* × 500)

PLATE 1

1-15. *Bhujiasporites hirsutus* gen. et sp. nov. Slide nos. 3307-3310.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15