

CORISACCITES GEN. NOV., A NEW SACCATE POLLEN GENUS FROM THE PERMIAN OF SALT RANGE, WEST PAKISTAN

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ABSTRACT

A reexamination of spores and pollen contained in the Kathwai shale, 25 ft. above the Talchir boulder bed, has revealed considerable information regarding the age of these beds. Virkki (1946) investigated this material.

The present paper deals with pollen grains designated as "Spore 5" by Virkki (1946) and later included under *Lueckisporites* by Potonié and Potonié & Klaus (1954). These pollen differ from *Lueckisporites* in not possessing an intrabaculate exoexinal cap on the central body and hence included here in a new genus *Corisaccites*. The genus is compared with other bisaccate genera like *Taeniaesporites*, *Lunatisporites* and *Chordasporites*.

INTRODUCTION

BISACCATE pollen grains from the Permian sediments are mostly characterized by proximally grooved (=fissure or furrow striations according to some authors) central body. The grooves, in most of the cases, run parallel along the length of the body, but in some cases intersecting vertical and horizontal grooves are equally well developed (BHARADWAJ, 1962) or in others the grooves may form reticulate pattern almost looking like mud-cracks (BHARADWAJ & TIWARI, 1964; VENKATACHALA & KAR, 1964; WILSON, 1962). In some of the bisaccate genera, however, there is present only one or few fissures which are very distinct often leaving two or more longitudinal band-like areas (POTONIÉ & KLAUS, 1954; LESCHIK, 1955, 1956, 1959).

The genus presently under consideration was recovered by maceration from a carbonaceous shale about 20'-25' above the Talchir boulder bed at Salt Range, Kathwai, West Pakistan. The material was collected by A. R. Gee in 1936.

The shales were treated with commercial nitric acid for three days, followed by a quick wash with 5 per cent potassium hydroxide solution and subsequently treated with 40 per cent hydrofluoric acid. After repeated washing the macerate was mounted with polyvenyle alcohol and Canada balsam.

SYSTEMATIC PALYNOLOGY

Corisaccites gen. nov.

Pl. 1, Figs. 1-11

Type Species — *Corisaccites alutas* sp. nov.

Generic Diagnosis — Disaccate pollen grains, central body well defined, subcircular to oval, exine moderately thick, granulose to microverrucose. Prominent furrow present proximally, parallel to the longitudinal axis, splitting the body into two reniform halves (see TEXT-FIGS. 1-3). Proximal attachment of saccus to central body equatorial, distal attachment almost straight, perpendicular to the furrow, leaving a broad saccus free body area. Saccus subsaccate, leathery, mostly semicircular, dense and punctate to closely intrareticulate.

Generic Description — Haploxyloloid to slightly diploxyloloid pollen grains with bilateral symmetry. Subcircular to oval; 46-40 μ \times 50-96 μ . Central body subcircular to horizontally oval; body exine 1-2 μ thick, granulose or microverrucose, in some specimens ornamentation closely set, while in others it is scanty or indistinct. Proximal furrow always present parallel to the longer axis of the central body, often, causing the central body to fracture into two reniform halves which sometimes detach themselves and lie wide apart from each other. In some specimens one or two additional minor furrows parallel to main furrow may also develop (PL. 1, FIG. 6). Proximal attachment of sacci to central body along the equator, distal attachment is close or fairly apart from each other, perpendicular to longitudinal furrow. Sacci often detach from central body; such separated specimens are commonly observed in preparations. In some specimens, sacci extend laterally to form a monosaccoid condition. Saccus dense, thick and leathery, intrastructure in most of the specimens cannot be clearly formed and in some specimens suggestions of intrapunctate structure are commonly seen [such sacci have been described as "subsaccate" (JIZBA, 1962)].

Comparison — *Corisaccites* is closely comparable to *Lueckisporites* (POTONIÉ & KLAUS) Potonié (1958) in its general organization. The central body in *Lueckisporites* is laevigate and structureless while the exo-exinal cap is intrabaculate. *Taeniaesporites* Leschik, distinguishes in possessing 4-6 furrows on the central body though it seems that the type species has only three furrows (POTONIÉ *l.c.*). *Corisaccites* can be distinguished from *Taeniaesporites* by the presence of very thick, leathery, subsaccate nature of the saccus and microverrucose to granulose central body. *Lunatisporites* (LESCHIK) Bharadwaj (*l.c.*) is characterized by biconvex sulcus and intramicroreticulate central body. *Chordasporites* Klaus (1960) differs in having a ridge ('Chorda') on the central body and the sacchi are distinctly intrareticulate.

The general resemblance between *Corisaccites* and *Lueckisporites* is so great that the institution of a separate genus may be easily questioned. The presence of thick cap-like exo-exinous layer in *Lueckisporites* is so distinct that it could be easily differentiated from *Corisaccites*. Mention should, however, be made that the presence or absence of proximal cap and its thickness are used to differentiate pollen of *Pinus*, *Abies*, *Keteleeria* and *Picea* in dispersed condition.

Remarks — Virkki (1946) has illustrated Text-figure (FIG. 36, p. 127) and photographs (PL. 3, FIGS. 31, 32, PL. 6, FIGS. 63, 64) of same type of pollen grains from similar carbonaceous shale from Kathwai and as well as from Warcha (W. Pakistan). She, however, described these pollen grains as 'Spore 5' and regarded them as bilateral tetrads having finely granulose exine and radial striations.

Derivation of name — Latin: *Cori* (*um*) =leather.

Corisaccites alutas sp. nov.

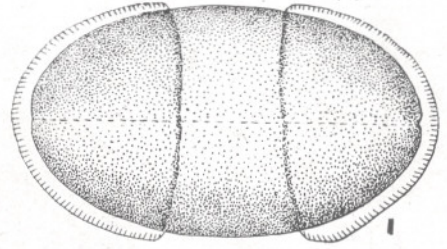
Pl. 1, Figs. 1-7; Text-figs. 1 & 2

Holotype — Pl. 1, Fig. 1; Size $78 \times 69 \mu$; Slide No. 2209.

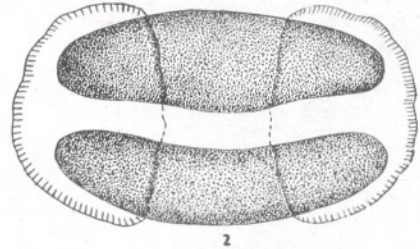
Isotype — Pl. 1, Fig. 2; Size $68 \times 54 \mu$, Slide No. 2210.

Type Locality — Kathwai, Permian, Salt Range, West Pakistan.

Specific Diagnosis — Subcircular; central body subcircular with a single longitudinal furrow. Exine thick, granulose to microverrucose; sacchi ill-developed, leathery.



TEXT-FIG. 1 — *Corisaccites alutas* gen. et sp. nov. Polar view showing the central body intact with typical bisaccate condition.



TEXT-FIG. 2 — *Corisaccites alutas* gen. et sp. nov. Polar view showing the body split into two reniform halves.

Specific Description — Subcircular — circular, overall size range $46-64 \mu \times 50-69 \mu$, central body well defined, body exine apparently thinner than sacchi, granulose or microverrucose. A transverse median longitudinal furrow parallel to longitudinal axis splits the body into two uniformly wide reniform halves (TEXT-FIG. 1). Proximal attachment of sacchi to central body equatorial; distal attachment full and straight in well preserved and flattened specimens; sulcus uniformly broad and easily distinguishable. Sacchi less than semicircle, dense, thick and leathery, intrastructure indistinct in most of the cases and seems to be feebly intrareticulate or intragranulose. In a number of specimens the two halves of the central body detach themselves completely to give the appearance of quadrants (TEXT-FIG. 2).

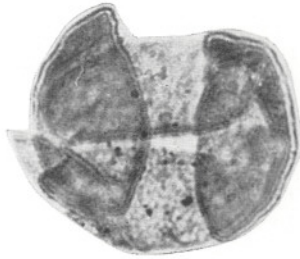
Corisaccites vanus sp. nov.

Pl. 1, Figs. 8-11; Text-fig. 3

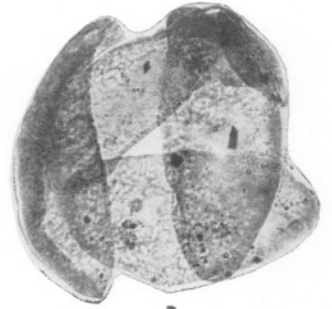
Holotype — Pl. 1, Fig. 8. Size $106 \times 82 \mu$, central body $78 \times 65 \mu$; Slide No. 2211.



1



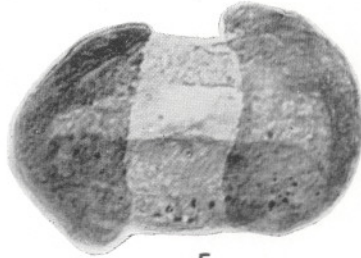
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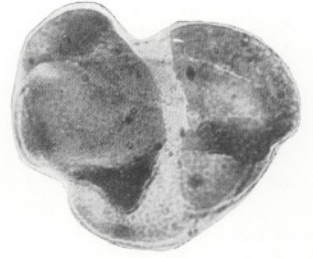
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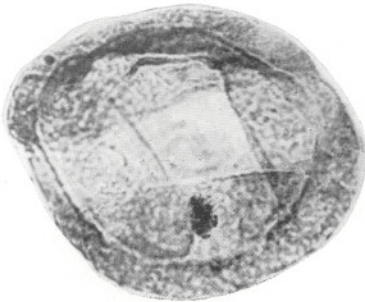
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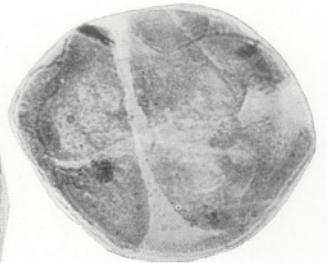
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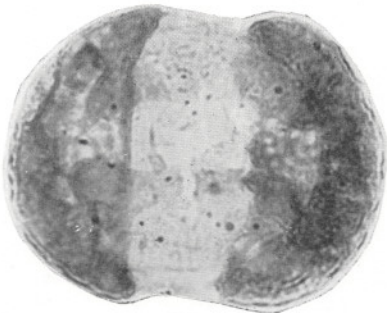
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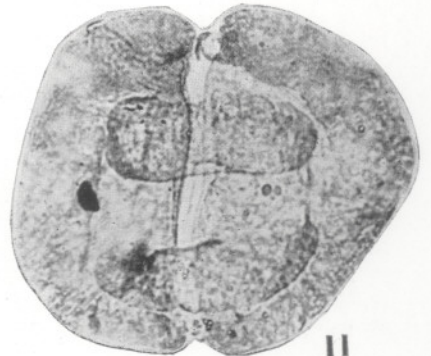
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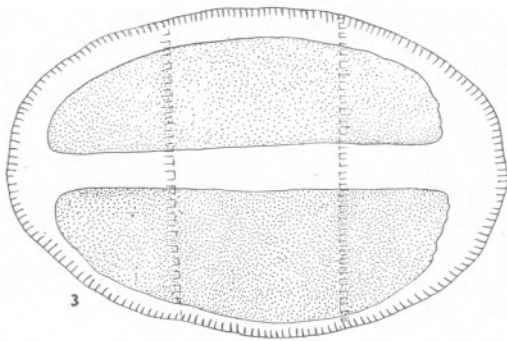
7



10



11



TEXT-FIG. 3 — *Corisaccites vanus* sp. nov. Polar view showing the monosaccate condition, split central body and saccus attachment.

Isotype — Pl. 1, Fig. 10, Size $96 \times 78 \mu$; central body $78 \times 69 \mu$; Slide No. 2210.

Type Locality — Kathwai, Permian, Salt Range, West Pakistan.

Specific Diagnosis — Haploxytonoid, central body horizontally oval with a single furrow, sulcus uniformly broad.

Description — $78-82 \mu \times 82-105 \mu$. Central body well marked, size range $60-69 \mu \times 62-73 \mu$. Exine sparsely granulate or microverrucose. Proximal attachment equatorial; distal attachment straight leaving a broad bladder free sulcus area. Sacci less than semicircle, leathery, dense, mostly closely intrareticulate. In most of the specimens studied, sacci extend laterally to appear monosaccoid in appearance (TEXT-FIG. 3).

Comparison — *Corisaccites vanus* resembles with *C. alutas* in having single furrow on the central body but differs in the presence of horizontally oval central body and monosaccoid appearance.

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EXPLANATION OF PLATES

(All photo-micrographs are enlarged $500 \times$. The slides are preserved at the museum of the Birlal Sahnî Institute of Palaeobotany, Lucknow, India)

PLATE 1

1-7. *Corisaccites alutas* gen. et sp. nov. Slide Nos. 2209, 2210.

8-11. *Corisaccites vanus* sp. nov. Slide Nos. 2211 & 2210.