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TWO NEW POLLEN GENERA FROM THE LOWER TERTIARY SEDIMENTS OF MEGHALAYA, INDIA

S. K. M. TRIPATHI & H. P. SINGH
Birbal Sahni Institute of Palaeobotany, 53 University Road, Lucknow 226 007, India

ABSTRACT

Two new pollen genera, viz., *Collospermumpollis* and *Densiverrupollenites* have been established. The genus *Collospermumpollis* has been recovered from the Palaeocene sediments of Therria Formation, Jaintia Hills, Meghalaya and seems to have liliaceous affinity. The genus *Densiverrupollenites* has been described from the Upper Eocene sediments of the Kopili Formation, Jaintia Hills, Meghalaya. Its botanical affinity is uncertain.

Key-words— Palynology, *Collospermumpollis*, *Densiverrupollenites*, Lower Tertiary, India.

सारांश

मेघालय (भारत) के अधरि तृतीयक युगीन अवसादों से प्राप्त दो नवीन परागकण वंश – सूर्यकान्त मणि त्रिपाठी एवं हरीपाल सिंह

इस शोध-पत्र में कोलोस्पर्ममपॉलिस एवं डेन्सीवेरुपॉलिनाइटिस नामक दो नवीन परागकण वंश बनाये गये हैं। कोलोस्पर्ममपॉलिस वंश मेघालय की जयन्तिया पहाड़ियों के थैरिया शैल-समूह के पुरानूतन कालीन अवसादों से उपलब्ध हुआ है तथा लिलिएसी कुल से सजातीयता व्यक्त करता है। डेन्सीवेरुपॉलिनाइटिस वंश जयन्तिया पहाड़ियों के कोपिली शैल-समूह के उपरि आदिनूतन अवसादों से वर्णित किया गया है तथा इसकी वनस्पतिक सजातीयता अभी सुनिश्चित नहीं हो पाई है।

INTRODUCTION

A DETAILED palynostratigraphical work on the Palaeocene-Eocene sediments of Meghalaya revealed the presence of two new pollen genera, viz., *Collospermumpollis* and *Densiverrupollenites*. Both these genera have been studied morphologically, illustrated and compared with the other comparable fossil pollen genera. The pollen grains of *Collospermumpollis* occur in the lower part of the Therria Formation (Palaeocene). This formation is exposed along the road cuttings near Jowai in the south-east of Shillong. Morphologically pollen grains of *C. laevigatus* are closely comparable to those of the extant form *Collospermum microspermum* (Cranwell, 1953).

The genus *Densiverrupollenites* has been recovered from upper part of the Kopili Formation (Upper Eocene). The sediments of this formation are also exposed along the Jowai-Badarpur road between Jowai and Sonapur, Jaintia Hills, Meghalaya. It has been difficult to surmise any exact botanical affinity to the pollen grains of *Densiverrupollenites*.

SYSTEMATIC DESCRIPTION

Anteturma — *Pollenites* Potonié, 1931
Turma — *Plicates* (Naumova) Potonié, 1960
Infraturma — *Monoptyches* (Naumova) Potonié, 1958

Genus — *Collospermumpollis* gen. nov.

Type species — *Collospermumpollis laevigatus* sp. nov.

Diagnosis — Pollen grains semicircular to semiovoidal; monocolpate, colpus widely

open, long; sexine as thick as nexine; sexine smooth, nexine indistinctly structured to punctate.

Comparison — *Liliacidites* Couper (1953) is distinctly different from the present genus in having reticulate ornamentation. *Liliapollis* Krutzsch (1970) possesses crotonoid to columellate sculpture of the exine and is non-tectate. *Palmidites* Couper (1953) is elliptical to oval in shape and possesses narrower colpus. *Monosulcites* Cookson (1947) is smaller in size, oval in shape and generally has smooth exine. *Arecipites* Wodehouse (1933) is elliptical to elongate-oval in shape, smaller in size and possesses a reticulate exine without having clavae or baculae in optical section. *Pinjoriapollis* Saxena & Singh (1981) is elliptical to lanceolate in shape, heteropolar and bigger in size.

Collospermumpollis laevigatus sp. nov.

Pl. 1, figs 7-10; Text-fig. 1

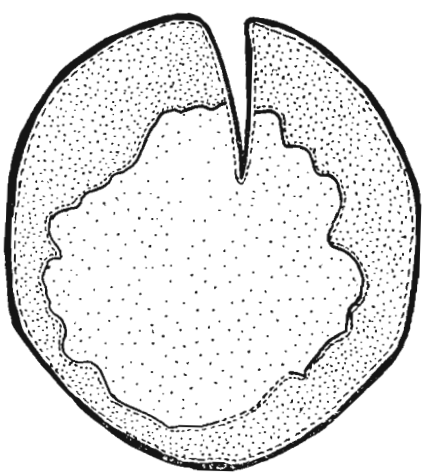
Holotype — Pl. 1, fig. 8; slide no. 6948.

Type Horizon — Therria Formation.

Type Locality — At 79.5 km from Shillong on Shillong-Badarpur Road, Meghalaya.

Diagnosis — Pollen grains semicircular to semiovoidal; monocolpate, colpus distinct, widely open, sexine as thick as nexine, sexine laevigate, nexine indistinctly structured, often appearing punctate.

Description — Pollen grains semicircular to semiovoidal in shape, some specimens exhibiting unequally broad lateral ends, size 86×79-140×110 μm (holotype 120×110 μm). Monocolpate. Colpus distinct, wide, ±parallel to the margin of pollen. Exine 1.5-3 μm thick, sexine and nexine almost equally thick, sexine apparently laevigate, nexine indistinctly structured, sometimes punctate.



TEXT-FIG. 1—*Collospermumpollis laevigatus* gen. et sp. nov.

Occurrence — Lower-Middle part of Therria Formation (Palaeocene), Meghalaya.

Affinity — Monosulcate pollen grains are mostly met within the families Amaryllidaceae, Iridaceae, Liliaceae and Palmae, where the colpus is generally not very wide. However, *Collospermumpollis laevigatus* gen. et sp. nov. can be compared with the pollen grains of extant plant *Collospermum microspermum* (Liliaceae). Pollen grains of this plant measure up to 48 μm in size, and have a widely open colpus with distinctly smooth exine (Cranwell, 1953, fig. 51).

Collospermumpollis (Venkatachala & Kar, 1969) *ellipticus* comb. nov.

1969 *Liliacidites ellipticus* Venkatachala & Kar, pl. 1, fig. 13.

Holotype — Venkatachala & Kar, 1969, Pl. 1, fig. 13.

Diagnosis — As published by Venkatachala & Kar, 1969.

Remarks — Venkatachala and Kar (1969) reported *Liliacidites ellipticus* with the following diagnosis: "Pollen grains oval-elliptical in shape, 30-43×25-28 μ. Sulcus broad and ± boat-shaped, exine finely intramicroreticulate". Thus it is clear from the diagnosis of *L. ellipticus* that its sexine is smooth, whereas the nexine is microreticulate. Hence it has been transferred to *Collospermumpollis*.

Infraturma — *Prolati* Erdtman, 1943

Genus — *Densiverrupollenites* gen. nov.

Type species — *Densiverrupollenites eocenicus* sp. nov.

Diagnosis — Pollen grains spheroidal to subspheroidal in polar view; tricolporate, apertures subequatorially placed, brevicolpate, ora circular to slightly lalongate; exine ornamentation verrucae beset with gemmae.

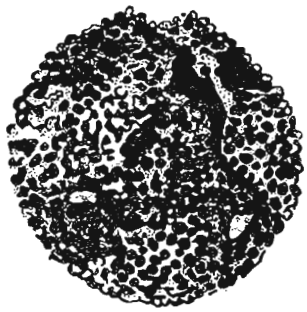
Comparison — *Faguspollenites* Raatz (1937) is spherical and tricolporate, but the

pores in it are rounded and equatorially placed. It has intragranulose to intrabaculate exine ornamentation. *Nyssapollenites* Thiergart (1937) is tricolporate but has intrapunctate exine and subtriangular shape. *Vitipites* (Wodehouse) Potonié (1960) and *Rhamnacidites* (Chitaley) Potonié (1960) possess long and narrow colpi. *Hippocrateaceaedites* Ramanujam (1966) is subtriangular, trizonicolporate and the sexine bears knob-like processes on both the sides of the colpus. *Trilatiporites* Ramanujam (1966) exhibits subequatorial pores but lacks colpi. *Psilatricolporites* v.d. Hammen (1956) is trizonicolporate, but in the present genus the colpi are very long and exine is psilate. *Lakiapollis* Venkatachala & Kar (1969) is tribrevicolporate and possesses laevigate to indistinct exine. *Tricolporopollis* Dutta & Sah (1970) is also tribrevicolporate but it exhibits reticulate to foveolate exine ornamentation. *Verrucolporites* Sah & Kar (1970) is tricolporate but possesses smaller size range and longer colpi. *Pellicieroipollis* Sah & Kar (1970) is smaller in size, triangular to subtriangular in shape (polar view), tegillate and possesses baculate ornamentation.

Densiverrupollenites eocenicus sp. nov.

Pl. 1, figs 1-6; Text-fig. 2

Holotype — Pl. 1, fig. 3; slide no. 6958.
Type Horizon — Kopili Formation.
Type Locality — At 133 km from Shillong on Shillong-Badarpur Road, Meghalaya.
Diagnosis — Pollen grains spheroidal to subspheroidal; tricolporate, brevicolpate; apertures subequatorially placed; exine 1.5-2.5 μm thick, sexine as thick as nexine, verrucate to gemmate, verrucae and gemmae very closely placed.
Description — Pollen grains spheroidal to subspheroidal in shape. Size 75-95 μm (holotype 78 μm). Tricolporate, brevicolpate, apertures subequatorially placed. Colpi lalongate, 8-10 μm long, mostly distinct. Ora distinct, circular to slightly lalongate, margin of ora thickened. Exine 1.5-2.5 μm thick, sexine as thick as nexine, ornamented with gemmae or verrucae. Gemmae 1-2 μm high, rounded and 2-3 μm wide. Verrucae and gemmae may be present on the same specimen. The verrucae or gemmae very closely placed giving an appearance of a negative reticulum in surface view.
Occurrence — Upper part of Kopili Formation (Upper Eocene), Meghalaya.
Affinity — Uncertain.



TEXT-FIG. 2 — *Densiverrupollenites eocenicus* gen. et sp. nov.

DISCUSSION

Both the genera, *Collospermumpollis* and *Densiverrupollenites*, besides being distinct morphologically are of stratigraphical importance as well. The former is associated with the Palaeocene sediments whereas the latter is identified with the Upper Eocene sediments. Some of the other important Palaeocene marker genera like *Couperipollis*, *Assamialetes*, *Liliacidites*, *Proxapertites*, *Palmidites* and *Dandotiaspora* have also been found in the *Collospermum* assemblage. Likewise, the occurrence of Upper Eocene genera, viz., *Striatriletes*, *Lakiapollis* and *Homotryblium* in association with *Densiverrupollenites* supports its stratigraphical importance.

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EXPLANATION OF PLATE

(All photomicrographs are enlarged ca. × 500)

1-6. *Densiverrupollenites eocenicus* gen. et sp. nov.; slide nos. 6943, 6944, 6958 (Holotype), 6944, 6945 and 6946; coordinates: 106.8 × 9.4, 99.8 × 12.4, 80.1 × 18.10 (Holotype), 86.9 × 21.5, 111.10 × 20.0 and 79.5 × 17.9 respectively.

7-10. *Collospermumpollis laevigatus* gen. et sp. nov.; slide nos. 6947, 6948 (Holotype), 6949 and 6948; Coordinates: 104.3 × 14.3, 100.5 × 6.2 (Holotype), 71.2 × 25.9 and 103.5 × 24.6 respectively.

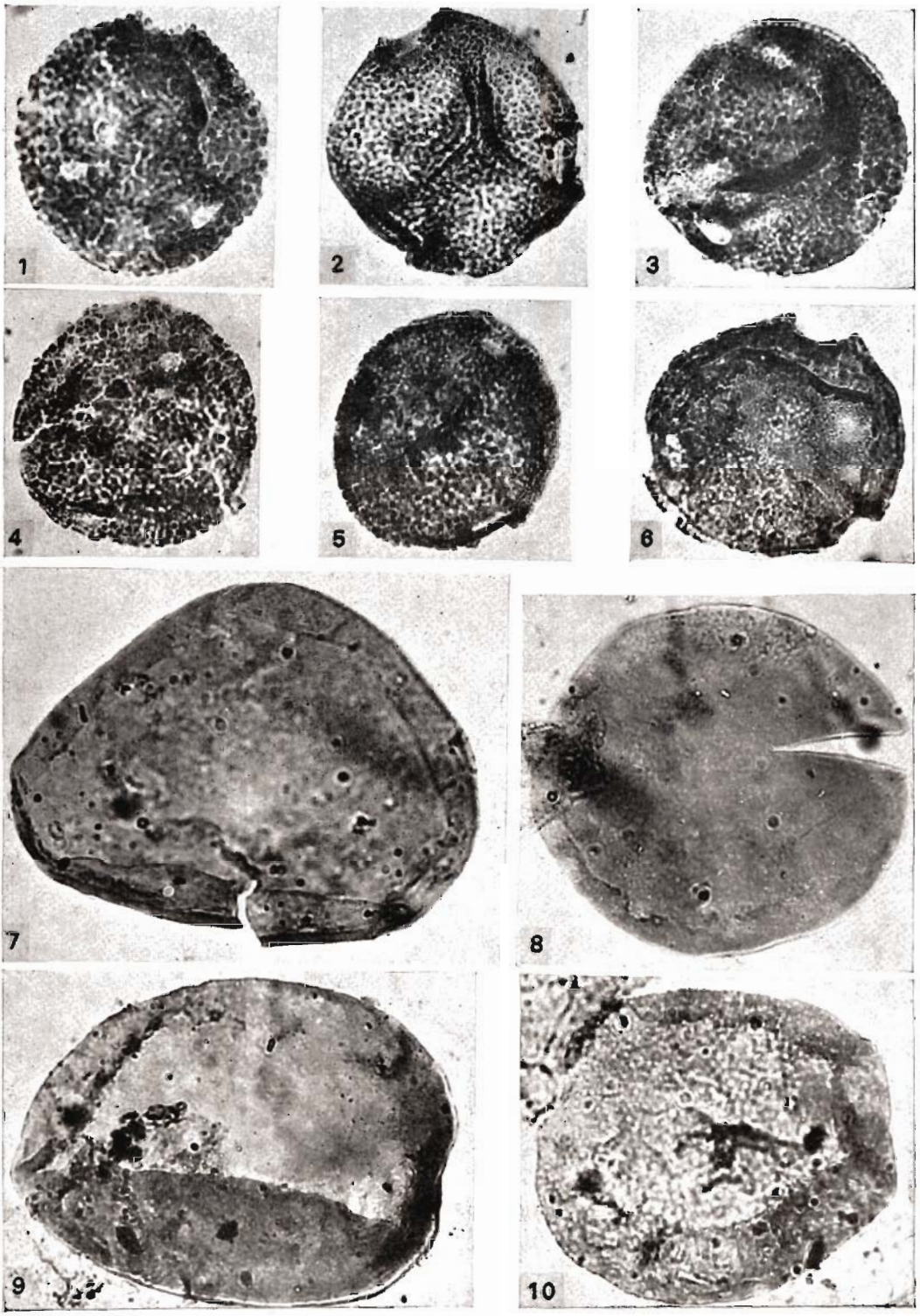

PLATE 1