

# *Echimonoporopollis*, a new pollen genus from the Neyveli Formation of Jayamkondacholapuram well-12, Tiruchirapalli District, Tamil Nadu

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Saxena, R. K., Khare, Sanjay & Misra, N. K. 1991. *Echimonoporopollis*, a new pollen genus from the Neyveli Formation of Jayamkondacholapuram well-12, Tiruchirapalli District, Tamil Nadu. *Palaeobotanist* 39(1) : 46-49.

A new pollen genus, *Echimonoporopollis*, has been recorded from the Neyveli Formation of Jayamkondacholapuram well-12 in Tiruchirapalli District, Tamil Nadu. The genus is represented by two species, viz., *E. grandiporus* and *E. neyveliensis* and is characterized by spherical-sub-spherical shape, single pore and spinose exine. The restricted and abundant occurrence of this genus in the lower zone of the Neyveli Formation (*Neocouperipollis* spp. Cenozoone) may prove vital in correlating this biozone with contemporary stratigraphic units

**Key-words**—Palynology, *Echimonoporopollis*, Stratigraphy, Neyveli Formation (India).

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## सारांश

तमिल नाडु के तिरुचिरापल्ली जनपद में जयमकोंडाचोलापुरम कुआँ-12 में निवेली शैल-समूह से एक नई परागकण प्रजाति, इक्वइमोनोपोरोपोलिस

रमेश कुमार सक्सेना, संजय खरे एवं नरेन्द्र कुमार मिश्रा

तिरुचिरापल्ली जनपद में जयमकोंडाचोलापुरम कुआँ-12 में निवेली शैल-समूह से उपलब्ध एक नई परागकण प्रजाति, इक्वइमोनोपोरोपोलिस का वर्णन किया गया है जो कि इ० ग्रेन्डिपोरस एवं इ० निवेलियेन्सिस नामक दो जातियों से निरूपित है। ये जातियाँ गोलाकार-लगभग गोलाकार, एक छिद्र तथा कंटकी बाह्यचोल से युक्त हैं। निवेली शैल-समूह (निओकाउपरिपोलिस जाति नवमंडल) के अधरि मंडल में इस प्रजाति की सीमित एवं प्रभावी मात्रा इस जैवमंडल की अन्य समकालीन स्तरिक इकाईयों से तुलना करने में सहायक सिद्ध हो सकती है।

THE term Neyveli Formation was introduced by Siddhanta (1986). This formation, encountered in Jayamkondacholapuram well-12 in Tiruchirapalli District, Tamil Nadu (Lat. 11°11'27"N : Long. 79°24'02"E), consists of a variety of sandstones, shales and clays with lignite bed at the top. The samples collected from this well have yielded a rich palynoflora including algal and fungal remains, pteridophytic spores and angiospermous pollen grains. In this assemblage, the genus *Echimonoporopollis* is new as it could not be accommodated in any of the known genera. A description of this genus is given below.

## DESCRIPTION

**Genus**—*Echimonoporopollis* gen. nov.

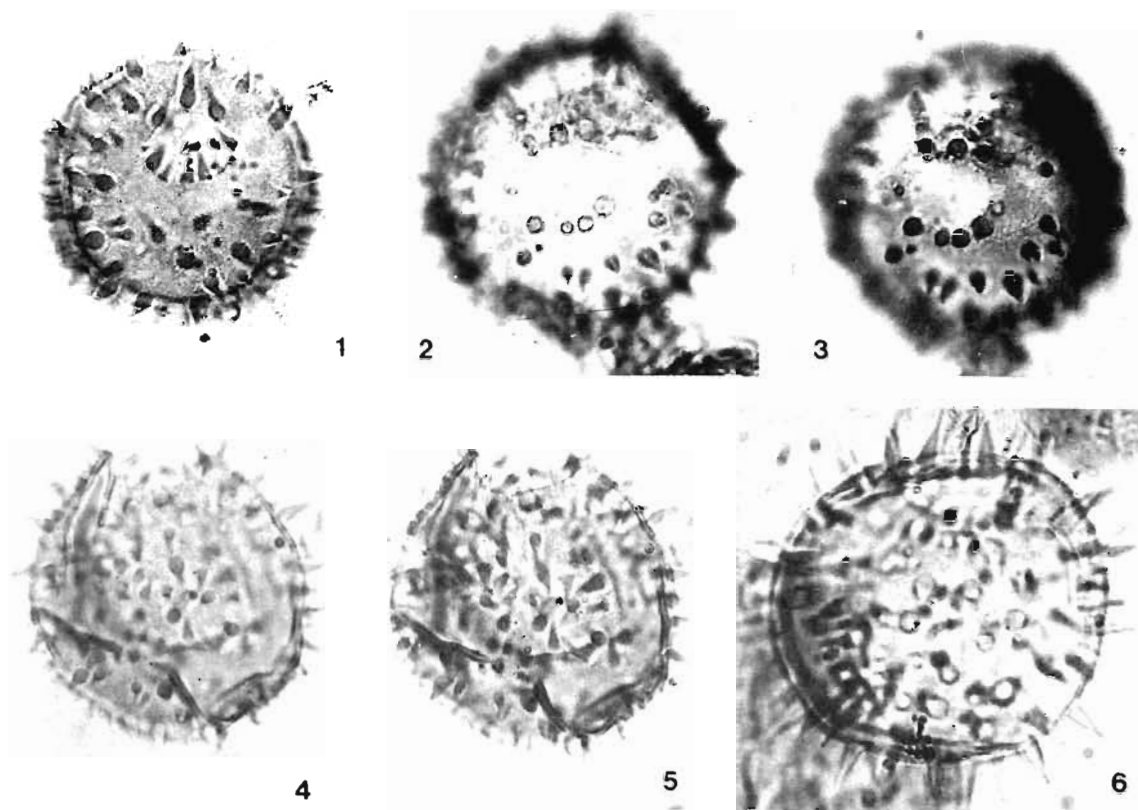
Type species—*Echimonoporopollis grandiporus*

gen. et sp. nov.

**Generic diagnosis**—Pollen grains spherical, subspherical or ovoidal, small to medium sized. Monoporate. Exine generally thin, spinose, spines vary in shape and size.

**Description**—Pollen grains are mostly spherical to subspherical in shape but may also be ovoidal. They possess a single, distinct, large, circular to oval pore with generally unthickened margin. The exine is generally thin, tectate and spinose, with sexine being as thick as nexine. The spines are robustly built, long, with pointed or blunt tips and are generally uniformly distributed. Interspinal area may be either psilate or punctate or microreticulate.

**Comparison**—The present genus is distinguished from *Monoporopollenites* Meyer 1956 emend. Potonié 1960 in having spinose ornamentation. *Graminidites* Cookson 1947 ex



## PLATE 1

(All photomicrographs are magnified  $\times$  ca. 1000. Coordinates of specimens in slides refer to the stage of Leitz Diaplan microscope no. 512834/074490).

1-5. *Echimonoropollis grandiporus* gen. et sp. nov.

1. Slide no. BSIP 9945 a, Coordinates:  $59.1 \times 92.3$ .

2, 3. Slide no. BSIP 9945, Coordinates:  $64.6 \times 105.4$ .

4, 5. Slide no. BSIP 9944 a, Coordinates  $64.1 \times 100.5$ .

6. *Echimonoropollis neyveliensis* sp. nov.: Slide no. BSIP 9944, Coordinates:  $48.1 \times 101.8$ .

Potonie 1960 is distinguished from this genus in having smaller, annulate pore and finely granulate exine. *Jacobipollenites* Ramanujam 1966 differs in having rugged cavity-like pore with wavy margin and retipilate exine. *Pandaniidites* Elsik 1968 resembles the present genus in having single pore and spinose exine but differs in being smaller in size and in having smaller (up to  $3 \mu\text{m}$  in diameter), annulate pore and shorter (up to  $1.5 \mu\text{m}$  long) spines. *Sparganiaceapollenites* Thiergart 1937 differs in having infrareticulate exine. *Spinamonoporites* Sah 1967 is also monoporate with spinose exine but differs from the present genus by its thick exine, which is densely covered with small (up to  $1.5 \mu\text{m}$  long) spinules. *Spinamonoporites* Norton & Hall 1969 resembles the present genus but is illegitimate being a junior homonym of *Spinamonoporites* Sah 1967. However, its type species, *Spinamonoporites typicus* Norton in Norton and Hall (1969) is

conspicuously different in possessing very short (up to  $1 \mu\text{m}$  long) spinules.

*Remarks*—The *Neocouperipollis* spp. Cenozoone of the Neyveli Formation is characterized by an overwhelming representation of spinose pollen, viz., *Spinainaperturites* Pierce (inaperturate), *Neocouperipollis* Kar & Kumar and *Arengapollenites* Kar (monosulcate), *Spinizonocolpites* Muller (meridionosulcate), *Acanthotricolpites* Kar (triporate) and *Echimonoropollis* gen. nov. (monoporate). These genera share in common the shape, size range and spinose ornamentation, yet generic differentiation has been made on the basis of number and nature of apertures. It is possible that these pollen derived from closely related taxa belonging to a single group. The criteria for demarcation of fossil angiospermous pollen genera are highly subjective. The current practice is to use apertural features for generic differentiation, hence

*Echimonoporopollis* is proposed to accommodate pollen characterized by a single pore and possessing similar ornamentation as in *Neocouperipollis*. A detailed study of these palynofossil groups vis-a-vis their extant counterparts is recommended for a better understanding of their relationship.

*Echimonoporopollis grandiporus* gen. et sp. nov.  
Pl. 1, figs 1-5

*Holotype*—Pl. 1, fig. 1, size 35  $\mu\text{m}$  (excluding spines); Slide no. 9945a; coordinates: 59.1  $\times$  92.3.

*Type locality and horizon*—Jayamkondacholapuram Well-12 (depth 142.3 m from ground level), Tiruchirapalli District, Tamil Nadu; Neyveli Formation (*Neocouperipollis* spp. Cenozoone).

*Diagnosis*—Pollen grains spherical to subspherical in shape. Size range 30-42  $\times$  29-40  $\mu\text{m}$  (excluding spines). Monoporate, pores distinct, circular to oval, ca. 7-13  $\mu\text{m}$  in diameter, pore margin unthickened. Exine up to 1.5  $\mu\text{m}$  thick, sexine as thick as nexine, spinose. Spines 3-6  $\mu\text{m}$  long, evenly distributed, bases of spines bulbous, tips of spines mostly pointed but may also be blunt. Interspinal area psilate, punctate or microreticulate.

*Echimonoporopollis neyveliensis* sp. nov.  
Pl. 1, fig. 6

*Holotype*—Pl. 1, fig. 6; size 43.5  $\times$  39  $\mu\text{m}$  (excluding spines); Slide no. 9944; Coordinates: 48.1  $\times$  101.8.

*Type locality and horizon*—Jayamkondacholapuram well-12 (depth 144.0 m from ground level), Tiruchirapalli District, Tamil Nadu; Neyveli Formation (*Neocouperipollis* spp. Cenozoone).

*Diagnosis*—Pollen grains spherical to ovoidal in shape. Size range 41-46  $\times$  38-45  $\mu\text{m}$  (excluding spines). Monoporate, pore distinct, circular, 10-14  $\mu\text{m}$  in diameter, pore margin unthickened. Exine 0.5-1.0  $\mu\text{m}$  thick, sexine as thick as nexine, spinose. Spines uniformly distributed, robustly built, broad at base and gradually taper towards the tip, spine bases not bulbous, length of spines 6.2-9.6  $\mu\text{m}$ . Interspinal area punctate-microreticulate.

*Comparison*—*Echimonoporopollis grandiporus* sp. nov. closely resembles the present species in shape, size and nature of pores but can be readily distinguished by its comparatively shorter spines with bulbous bases. The spines in the present species are broad at base and gradually taper towards the tip.

### STRATIGRAPHIC SIGNIFICANCE

*Echimonoporopollis* abundantly occurs (9 per cent) in the *Neocouperipollis* spp. Cenozoone of the

Neyveli Formation encountered in Jayamkondacholapuram Well-12 (Saxena & Khare, in Press) and is restricted to it. The abundance and restricted occurrence of this taxon may be useful for demarcating this biozone in other laterally developed sections. Other significant and restricted palynotaxa of this biozone are *Spinainaperturites* spp. (8%), *Neocouperipollis* spp. (30%), *Arengapollenites* sp. (1.5%), *Spinizonocolpites* spp. (14%), *Acanthotricolpites* spp. (23%), etc. The close association of the above spinose pollen genera suggests that they collectively form a pollen complex, with *Echimonoporopollis* as one of its constituents. It has been noticed that such a pollen complex is an essential feature of the Palaeocene sediments of Kutch (Saxena, 1981; Kar, 1985), Bengal Basin (Baksi & Deb, 1980) and Meghalaya (Biswas, 1962; Dutta & Sah, 1970; Sah & Singh, 1974; Tripathi & Singh, 1984; Kar & Kumar, 1986; and others) and thereby suggests the *Neocouperipollis* spp. Cenozoone being Palaeocene in age.

### ACKNOWLEDGEMENTS

The authors express their gratitude to Shri B. C. Pande, Director, Coal Division-IV, Geological Survey of India, Calcutta for providing samples for the present study and to Dr B. S. Venkatachala, Director, BSIP, Lucknow for helpful suggestions. The present work has been carried out under a project no. 24(171) 86-EMR II sponsored by C.S.I.R., New Delhi. Two of the authors (S. K. & N. K. M.) are grateful to C.S.I.R., New Delhi for the award of Junior Research Fellowship during the progress of this work.

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