rangium shows 225–260 distinct spore mother cells (80% of the total cells). Among these, 85% of the cells show nuclei with chromatid material (interphase) of which 40% cells show early prophase with the beginning of condensation of chromosomes (Figure 2 e). Nuclei about one-fifth of the cell diameter are consistently observed. In four cells clear metaphase stage is seen with chromosomes arranged on the equatorial plane (Figure 2 f). The actual number of chromosomes is difficult to ascertain. Nevertheless, 10–14 chromosomes could be counted. Further, scattered pollen grains, some of them in sectional view, could be seen (Figure 2 g). The pollen grains are monosulcate, boat-shaped, somewhat elliptical, 25–26 μm × 10–25 μm with more or less smooth wall. The present finding of the chromosomes could be of some use to discuss the relationship of Pentoxylon.

Pentoxylon is a unique fossil gymnosperm found in the Rajmahal hills (India), Australia and New Zealand and supplements evidence of continental drift. Considering the diversified morpho-anatomical characters of stem, leaf and male and female fructifications, it remains as an isolated gymnosperm with obscure affinities1,10 that originated in the Jurassic period and became extinct in Lower Cretaceous. Further, in light of the lesser number of chromosomes observed, it appears that this plant must have had a low basic number of chromosomes like in extant members of Cycadaceae, Araucariaceae and Pinaceae1,12 and remained as a least evolved gymnosperm.


Record of new petrified epiphyllous fungi (Polyphytaethyrites) from the Deccan Intertrappean beds of Mohgaon Kalan, Madhya Pradesh, India

A petrified epiphyllous fungus with ascocarps made up of many closely placed hyphae forming radial and transverse strands was recorded from the Early Tertiary (Palaeocene) of India.

Fungi are mostly dependent on plants for their nourishment which they derive either as parasite or saprophyte. They are responsible for many plant diseases, often of serious nature. They thrive on all possible parts of plants, especially on leaves. Many fungi of the order Hemisphaeriaceae, class Ascomycetes flourish on the upper surface of the leaf forming a minute, flattened, dimitidate, and shield-shaped ascocarp by the interconnection of the hyphae making radial and transverse strands.

The fossil ascocarps reported here are observed in randomly cut thin sections of chert along with other plant tissues collected from a village, Mohgaon Kalan (79°11′E, 22°1′N; Figure 1) and belong to the Deccan Intertrappean sediments. The chert is well exposed around the village and neighbourhood, and is rich in plant and animal fossils11. The geology of the Deccan Traps has been worked out by many researchers6–10 and the absolute date of the basalts varies from 67.8 to 61.6 Ma.

The ascostromata are dimitidate and generally subcircular in shape with wavy margin, sometimes they are oval and while broken, may be semicircular. The size is unusually larger than the other known fossil ascocarps and varies from 3.5 to 10 mm.

![Figure 1](image_url)  
*Figure 1. Map showing the location of Mohgaon Kalan from where the material was collected.*

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carp of present-day *Microthyrium micro- 
scopicum* is ostiolate and the radial and 
transverse strands are formed by a single 
Kar and Saxena closely resembles the pre-
sent specimen in shape, dimidiate disposi-
tion and non-ostiolate condition, but 
the latter is easily distinguished by its bigger 
size range and the formation of radial 
and transverse strands by the juxtaposi-
tion of many hyphae. *Parmathyrites* 
Jain and Gupta is also differentiated by 
its robustly built spinose marginal cells. 
*Kutchiathyrites* Kar is readily separated 
by its eccentric development of the lea-
thy ascostromata. *Notothyrites* Cook-
son is distinctly ostiolate and the radial 
and transverse hyphae are made up of 
single cells. *Palaeaeasterina* Mitra, Bera 
and Banerjee is also ostiolate with fimb-
riate margin; the middle region is thick-
ened and the transverse hyphae are ill-
developed.

Since the specimen detailed here is not 
similar to any of the living and fossil 
forms, it is placed into a new form genus, 
*viz. Polyphythaeryites* gen. nov. and 
a new species, i.e. *Polyphythaeryites gigan-
ticus* sp. nov. The generic name is deri-
ved after the multihyphal radial and trans-
verse strands of the ascostromata and the 
specific name is coined after its large size 
(Holotype: BSIP Museum no. 391002; 
Locality and horizon: Mohgaon Kalan, 
Chhindwara District, Madhya Pradesh, 
Deccan Intertrappean Beds; Repository: 
Birbal Sahni Institute of Palaeobotany, 
Lucknow).

The Hemispheariales, also known as 
Microthyriales, are quite common in the 
Upper Cretaceous and Tertiary sediments 
of India. The ascocarps of all these 
forms are mostly one-celled and the radial 
and transverse strands are made up of a 
single row of hyphae. An ‘object of un-
known attribution’ illustrated by Sahni 
and Rao[1] (plate 4, Figure 37) from the 
Deccan Intertrappean beds of Sausar, 
Madhya Pradesh closely resembles the 
present genus in the presence of polyhy-
phal radial and transverse strands. The 
other fungal remains from the Deccan 
Intertrappeans listed by Bande et al.[4] 
are not comparable to the form reported here. 
*Polyphythaeryites* instituted here is the 
only exception where the radial and trans-
verse strands are formed by many hyphae. 
Perhaps this innovation was necessary to 
tain the large size of the ascostromata. 
But this trait proved to be futile, as in the 
Late Tertiary sediments this genus or 
other forms with multiple hyphae are not 
observed.

India*, 1944, 14, 1–39.
3. Lakhani, R. N., Prakash, U. and Bande, 
4. Bande, M. B., Chandra, A., Venkatachala, 
B. S. and Mehrotra, R. C., *In Palaeocoe 
of India* (ed. Maheshwari, H. K.), *Indian As-
sociation of Palynostratigraphers, Lucknow, 
5. Kar, R. K., Ambwani, K., Sahni, A. and 
Sharma, P., *Palaeobotaun*, 2003, 52, 73– 
79.
7. Subbarao, K. V., Chandrasekaram, D., 
Navaneetha-Krishnan, P. and Hooper, P. R., 
*In Volcanism* (ed. Subbarao, K. V.), *Wiley 
8. Venkatesan, T. R., Pande, K. and Gopalan, 
181–189.
9. Venkatesan, T. R., Pande, K. and Gheva-
10. Widdowson, M., Pringle, M. S. and Fer-
11. Alexopoulos, C. J. and Mims, C. W., *Intro-
ductive Mycology*, *Wiley Eastern Limited*, 
New Delhi, 1979, 3rd edn, pp. 1–632.
13. Jain, K. P. and Gupta, R. C., *Palaeobo-
16. Mitra, S., Bera, S. and Banerjee, M., *Phyto-
18. Jain, K. P. and Kar, R. K., *Palaeobo-
tanist*, 1979, 26, 105–118.
19. Ramanujam, C. G. K. and Rao, K. P., 
*Fourth International Palynological Confer-

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Figure 2 a–c. *Polyphythaeryites giganticus* 
gen. et sp. nov. a. Specimen with ruptured 
central part giving the appearance of an osti-
ole, ca. × 20, paratype BSIP Museum no. 
391001. b. Same specimen magnified to show 
the setae and branched radial strands, ca. × 40. 
c. Holotype BSIP Museum no. 391002, ca. × 20.

4.0 mm. It has no opening in the middle, 
but in section the middle part is ruptured 
ocasionally giving an ostiolute appear-
ance. The hyphae of the specimen are 
characteristic; 8–25 hyphae are closely 
placed side by side to form radial and trans-
verse strands, which are slightly twisted 
and rope-like. The strands are intercon-
ected with each other to form a net-like 
structure. The cellular structures seen 
are often branched at the margin. The free 
hyphae are not observed and the stroma 
is one-celled. The margin is generally 
setose and the cells are thicker with sma-
ller meshes (Figure 2 a–c).

These specimens were compared with 
the extant and fossil forms; however, 
none was found to be similar. The asco-