

# *Kalviwadithyrites*, a new fungal fruiting body from Sindhudurg Formation (Miocene) of Maharashtra, India

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## ABSTRACT

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A rich palynoflora consisting of fungal remains, pteridophyte spores and angiosperm pollen has been recovered from Sindhudurg Formation exposed at Kalviwadi, Sindhudurg District, Maharashtra. In this assemblage, a fungal fruiting body *Kalviwadithyrites* is proposed as new and it could not be accommodated in any of the known fossil fungal genera.

**Key-words**—Fungal fruiting body, Sindhudurg Formation, Miocene, Maharashtra (India).

भारत के महाराष्ट्र प्रान्त के सिन्धुदुर्ग शैलसमूह (मायोसीन) से प्राप्त कालवीवेडाइथाइराटीज़ नामक एक नवीन कवकीय फल काय

मुलागलापल्ली रामचन्द्र राव

सारांश

महाराष्ट्र के सिन्धुदुर्ग के कालवीवाड़ी में अनावरित सिन्धुदुर्ग शैलसमूह से कवकीय अवशेषों, टेरिडोफाइट बीजाणुओं तथा आवृतबीजी परागकणों से युक्त एक सम्पन्न परागाणु वनस्पतिजात खोजा गया है। इस समुच्चय से प्राप्त कालवीवेडाइथाइराटीज़ नामक एक कवकीय फल काय नूतन प्राप्ति के रूप में प्रस्तावित किया जाता है तथा इसे किसी अन्य ज्ञात अशिमित कवक वंश के साथ नहीं रखा जा सकता।

**संकेत शब्द**—कवकीय फल काय, सिन्धुदुर्ग शैलसमूह, मायोसीन, महाराष्ट्र (भारत)।

## INTRODUCTION

THE Ratnagiri beds were first reported by Wilkinson (1871) from a number of well sections along the Ratnagiri Coast, Maharashtra. Subsequently, the Sindhudurg Formation was formally described a lithostratigraphic unit by Saxena (1995)

for a distinct sequence of grey to bluish clays with carbonaceous and lignite seams, which are well developed in the Konkan Coast of the Ratnagiri and Sindhudurg Districts of Maharashtra. Earlier this sequence was informally referred to as the Ratnagiri beds (Wilkinson, 1871; Saxena *et al.*, 1992).

The Sindhudurg Formation is located at Kalviwadi (Lat. 16°24'30" N: Long 73°26'10" E) about 0.6 km east of Mondtor bus stop near Tembhavi Village in Devgarh Taluk of

Sindhudurg District. The section consists of grey clay at the base succeeded by lignite, ironstone band, grey clay and laterite (Fig. 1). The samples collected from the lignite and clay have yielded a variety of fungal remains and spore-pollen. The present study deals with the fungal fruiting body.

## SYSTEMATICS

**Genus**—*KALVIWADITHYRITES* gen. nov.

**Type Species**—*KALVIWADITHYRITES SAXENAE* sp. nov.

**Generic Diagnosis**—Cleistothecium sub circular to circular in shape, dimidiate, non-ostiolate. Two types of cells present, pores absent. No hyphae present. Marginal cells rectangular to polygonal in shape, larger in size, covers outer part; central cells thickness 2 or 3 layered, squarish and isodiametric.

**Comparison**—The present genus closely compares with *Phragmothyrites* Edwards emend. Kar & Saxena (1976) and *Microthyriacites* Cookson (1947) in being circular, non-ostiolate and showing in no free hyphae but distinguished from the former by having two types of cells. *Notothyrites* Cookson (1947) differs in being ostiolate. *Parmathyrites* Jain & Gupta (1970) is distinguishable in having spines formed from the peripheral cells. *Siwalikiathyrites* Saxena and Singh (1984) is differentiated by its smaller size and lacking two sets of cells. *Ratnagiriathyrites* Saxena & Misra (1990) resembles the present genus in having non-radial cells but differs in its hexagonal porate cells.

**KALVIWADITHYRITES SAXENAE** sp. nov.

(Pl. 1:1-3; Fig. 2)

**Holotype**—Pl. 1.1, size 108 x 100  $\mu$ m, Slide No. BSIP 12689.

**Type Locality, Horizon & Age**—Kalviwadi, Sindhudurg District, Maharashtra, Sindhudurg Formation, Miocene.

**Description**—Cleistothecium circular- sub-circular. Size range 105-115 x 95-110  $\mu$ m. Dimidiate, non-ostiolate, No free hyphae. Fruiting body made up of two sets of cells, pores absent. Marginal cells rectangular to polygonal in shape, 9-12 x 10-17  $\mu$ m in diameter, light brown in colour. Central cells thickness 2 or 3 layered, squarish and isodiametric, 4-10  $\mu$ m in diameter, darker in colour.

**Affinity**—Unknown.

**Derivation of name**—This species is named in honour of Dr RK Saxena, Birbal Sahni Institute of Palaeobotany, Lucknow for his well known work on fossil fungi.

## DISCUSSION

The palynoflora recorded from the Sindhudurg Formation consists of 35 genera and 43 species comprising to fungal remains, pteridophyte spores and angiosperm pollen. The

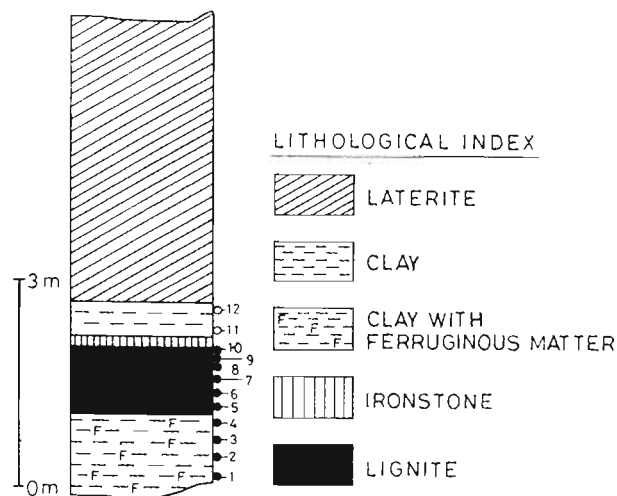


Fig. 1—Lithological details of Kalviwadi section (Sindhudurg Formation), Maharashtra.

assemblage contains profuse fungal remains represented by fruiting bodies (*Phragmothyrites*, *Microthyriacites*, *Notothyrites*, *Parmathyrites*, *Kutchiathyrites* and *Lirasporis*), spores (*Inapertisporites*, *Dyadosporonites*, *Dicellaesporites*, *Meliola*, *Multicellaesporites*, *Pluricellaesporites* and *Involutisporonites*) and also some hyphae. In addition to the above, *Kalviwadithyrites*, a fungal fruiting body recorded from the lignitic sediments has been proposed as new.

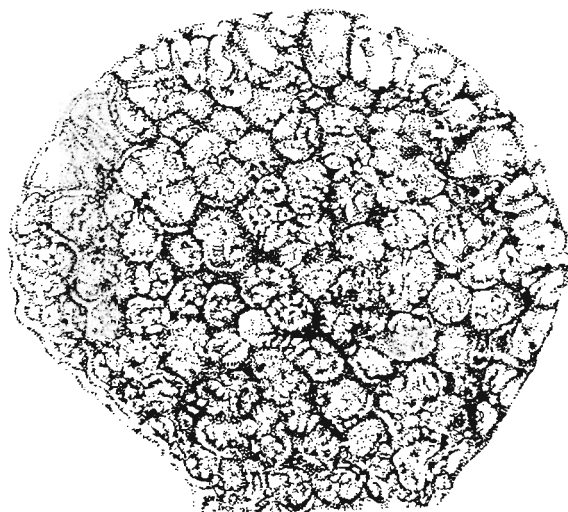


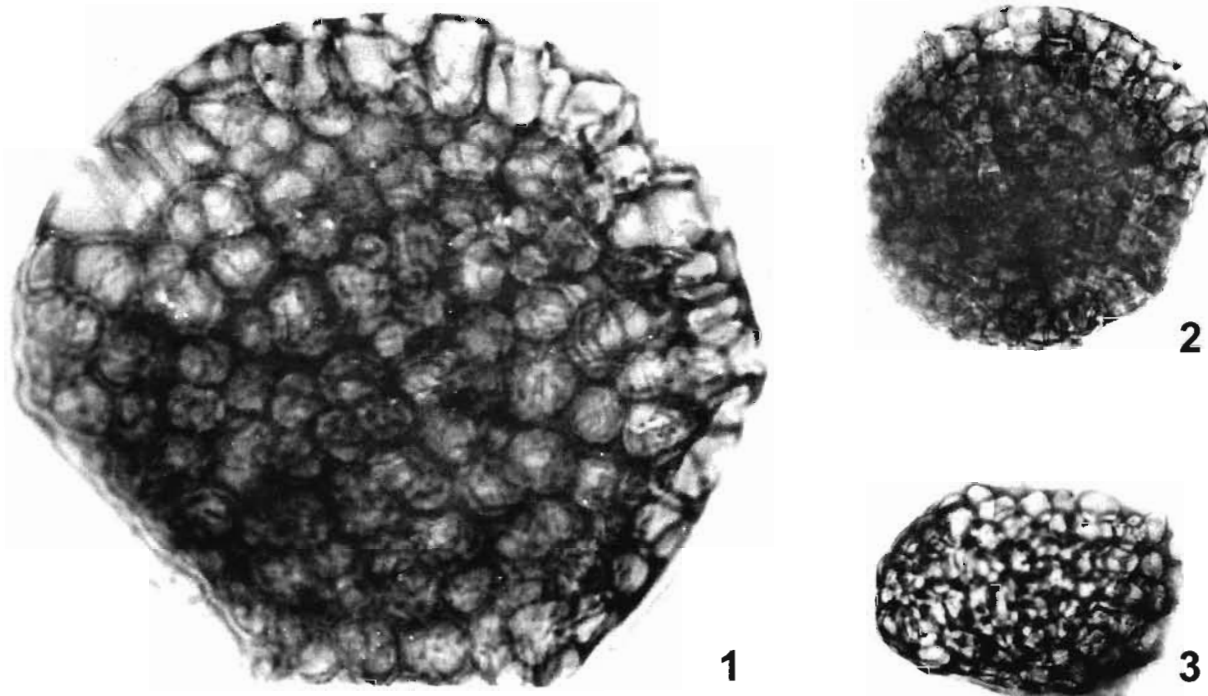
Fig. 2—*Kalviwadithyrites saxenae* gen. et sp. nov. x 1000.

The assemblage also contains pteridophyte spores (*Striatriletes susannae*, *Dictyophyllidites* sp., *Lygodiumsporites lakiensis*) and angiosperm pollen (*Quilonipollenites ornatus*, *Lakiapollis* spp., *Tricolporopollis* spp., *Dermatobrevicorporites* sp. and *Perforicorporites neyvelii*). *Heliospermopsis*, a salt gland of mangrove plant has also been recovered. Qualitative and quantitative analyses reveal that the fungal remains are dominant over pteridophyte spores followed by angiosperm pollen. The rich representation of fungal fruiting bodies and spores are typical of microthyriaceous epiphyllous fungi. Their occurrence in the present assemblage indicates the existence of a terrestrial plant ecosystem and supported by a warm and humid conditions with heavy rainfall. This view is also corroborated by the representation of pteridophyte spores and some angiosperm pollen.

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### PLATE 1

(Co-ordinates refer to the stage of BH2 Olympus microscope no. 217 267)

1. *Kalviwadithyrites saxenae* gen. et sp. nov. x 1000. Slide No. BSIP 12689, co-ordinates 14.0 x 151.0 (Holotype).
- 2-3. *Kalviwadithyrites saxenae* gen. et sp. nov. x 500. Slide Nos. BSIP 12689, co-ordinates 8.0 x 137.7; 12690 co-ordinates 7.7 x 156.0.